October 2000

IBM

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configuration and options guide (COG)

(formerly Server Paper Configurator Guide)

eserver xSeries Servers

Netfinity Servers

Storage Enclosures

Fibre Channel Solutions

Options

eserver PROVEN

ibm.com/pc/us/eserver/xseries/library

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Information Sources

Canada		
Audience	**Where to go**	**How to get**
IBM xSeries Configuration and Options Guide		
Customers	www.ibm.com/pc/us/eserver/xseries/library	Select "Technical Info."
Business Partners	www.ibm.com/pc/partner/ca	Select "Sales Tools" and then "Marketing Essentials". User ID and Password required.
IBM Employees	Marketing Essentials	By Brand category --> IBM Netfinity or By Brand category --> PC Configurator
Feedback	www.ibm.com/pc/partner/ca/feedback.html	
IBM xSeries and Netfinity Rack Configurator		
Customers	www.ibm.com/pc/us/eserver/xseries/library	Select "Technical Info."
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IBM Employees	Marketing Essentials	By Brand category --> IBM Netfinity or By Brand category --> PC Configurator
Feedback	E-mail ibm_netfinity_rack_configurator@vnet.ibm.com	
PCSales Guide/Configurator and WorkPad Pricer (Updated weekly or bi-weekly)		
Customers	www.can.ibm.com/config	Download PSC-NA1 and PSC-NA2
Business Partners	www.can.ibm.com/ibmpartners/info2/bppricing.html ID and password required	Download PSC-NA1 and PSC-NA2
IBM Employees	PartnerNEWS	View Folders/Views -- #4, PSC-NA1 and NA3/4
Feedback	e-mail bburgess@ca.ibm.com	
Latest Product & Technical Information		
Customers	www.ibm.com/pc/ca/netfinity or call 1-800-426-2255	
Business Partners	www.ibm.com/pc/partner/ca or call the PSMT	User ID and Password required
IBM Employees	Marketing Essentials	By Brand category --> IBM Netfinity or By Brand category --> PC Configurator
Latin America		
IBM xSeries Configuration and Options Guide		
Customers	www.ibm.com/pc/us/eserver/xseries/library	Select "Configuration Tools"
Business Partners	Marketing Essentials in ePartner	See footnote 2
IBM Employees	Marketing Essentials in Lotus Notes PartnerInfo	By Brand category --> IBM Netfinity or By Brand category --> PC Configurator
Feedback	E-mail laconfig@us.ibm.com	
IBM xSeries and Netfinity Rack Configurator		
Customers	www.ibm.com/pc/us/eserver/xseries/library	Select "Configuration Tools"
Business Partners	Marketing Essentials in ePartner	See footnote 2
IBM Employees	Marketing Essentials in PartnerInfo	By Brand category --> IBM Netfinity or By Brand category --> PC Configurator
Feedback	E-mail ibm_netfinity_rack_configurator@vnet.ibm.com	
OrderBUILDER[1] (updated weekly)		
Business Partners	Marketing Essentials in ePartner	See footnote 2
IBM Employees	Marketing Essentials in PartnerInfo	By Brand category --> IBM Netfinity or By Brand category --> PC Configurator
Feedback	E-mail laconfig@us.ibm.com	
Latest Product & Technical Information		
Customers	www.la.pc.ibm.com	
Business Partners	www.pc.ibm.com/la/ or www.pc.ibm.com/br/	See footnote 2
IBM Employees	Marketing Essentials in PartnerInfo	By Brand category --> IBM Netfinity or By Brand category --> PC Configurator

1. OrderBUILDER has features that are unique to a geographical region and should therefore be downloaded from a source intended for use in that region.
2. ID and Password required. Spanish==>http://www.pc.ibm.com/la. Select Partner World/VAR 2000. Then select either PartnerWorld or VAR2000 and request an ID and Password. Brazil==> http://www.pc.com/br/. Select PartnerWorld and then Formulario de Cadastramento. If you have an ID/Password, Spanish==> http://www.pc.ibm.com/la/. Select PartnerWorld/VAR2000. Then select Marketing Essentials, then PC Configurator. Brazil==> http://www.pc.ibm.com/br/. Select PartnerWorld and then Marketing Essentials.

See Next Page for United States and Additional URLs

United States

Audience	Where to go	How to get
IBM xSeries Configuration and Options Guide		
Customers	www.ibm.com/us/eserver/xseries/library	Select "Configuration Tools"
Business Partners	www.pc.ibm.com/partner/us/	Select Marketing Essentials > PC Configurator > Server Paper Configurator. User ID and Password required.
IBM Employees	Marketing Essentials	By Brand category --> IBM Netfinity --> Configurators or By Brand category --> PC Configurator
Feedback	www.ibm.com/pc/partner/us/feedback.html	
IBM xSeries and Netfinity Rack Configurator		
Customers	www.ibm.com/us/eserver/xseries/library	Select "Configuration Tools"
Business Partners	www.pc.ibm.com/partner/us/	Select Sales Tools, then Marketing Essentials, then IBM PC Server--> Rack Configurator. User ID and Password required.
IBM Employees	Marketing Essentials	By Brand category --> IBM Netfinity or By Brand category --> PC Configurator
Feedback	E-mail ibm_netfinity_rack_configurator@vnet.ibm.com	
OrderBUILDER[1] (updated bi-weekly)		
Customers	www.ibm.com/pc/us/orderbuilder	
Business Partners	www.ibm.com/pc/partner/us	Select Sales Tools, then OrderBUILDER. User ID and Password required.
IBM Employees	Marketing Essentials	By Brand category --> IBM Netfinity or By Brand category --> PC Configurator
	w3.pc.ibm.com/catalog/install.html	Intranet: Select Sales Automation then OrderBUILDER
Feedback	E-mail pcconfig@us.ibm.com	
Latest Product & Technical Information		
Customers	www.ibm.com/us/eserver/xseries/library or call 1-800-772-2227	
Business Partners	www.pc.ibm.com/partner/us/ or call 1-800-426-7763	Select Products & Services; User ID and Password required
IBM Employees	Marketing Essentials	By Brand category --> IBM Netfinity or By Brand category --> PC Configurator

Additional URLs

Audience	Where to go	How to get
Technical spec sheets (PSREF)	www.ibm.com/us/eserver/xseries/library	Select "Technical spec sheets (PSREF)"
IBM Datacenter Solutions	www.developer.ibm.com/welcome/netfinity	Under "News" select "Solutions Library". Under "Most Popular Solutions" select "Windows 2000 Datacenter Server"
Clustering (US, LA)	www.ibm.com/pc/us/netfinity/clustering.html	Select desired category or Server
Clustering (CAN)	www.ibm.com/pc/ca/netfinity/clustering.htm	Select desired category or Server
Benchmark Results	www.pc.ibm.com/ww/eserver/xseries/benchmarks/	Select desired category or Server
Options/NOS/Server compatibility	www.ibm.com/pc/us/compat	From pulldown select desired category
NOS - Hot-Plug/Failover Support	www.ibm.com/pc/us/compat	From pulldown select "Netfinity Hotplug PCI and Failover Info".
IBM Storage Products	www.ibm.com/storage	
Adobe® Acrobat® Reader V 3.0 or 4.0	www.adobe.com/products/acrobat/readstep.html	Follow instructions.
Adv. Sys. Mgmt. Adapter Firmware	www.ibm.com/pc/us/netfinity	Select "Support", "Family", "Model", "Downloadable files" and "Advanced Systems Management".
Flash BIOS Updates	www.ibm.com/pc/support	Enter machine "Type-Model" in Quick Path. Select "Downloadable files" then "BIOS".
ServeRAID Updates	www.ibm.com/pc/support	Select "Server" in Brand pulldown, "ServeRAID" in Family pulldown and then "Downloadable files".

1. OrderBUILDER and ConfigXpert have features that are unique to a geographical region and should therefore be downloaded from a source intended for use in that region.

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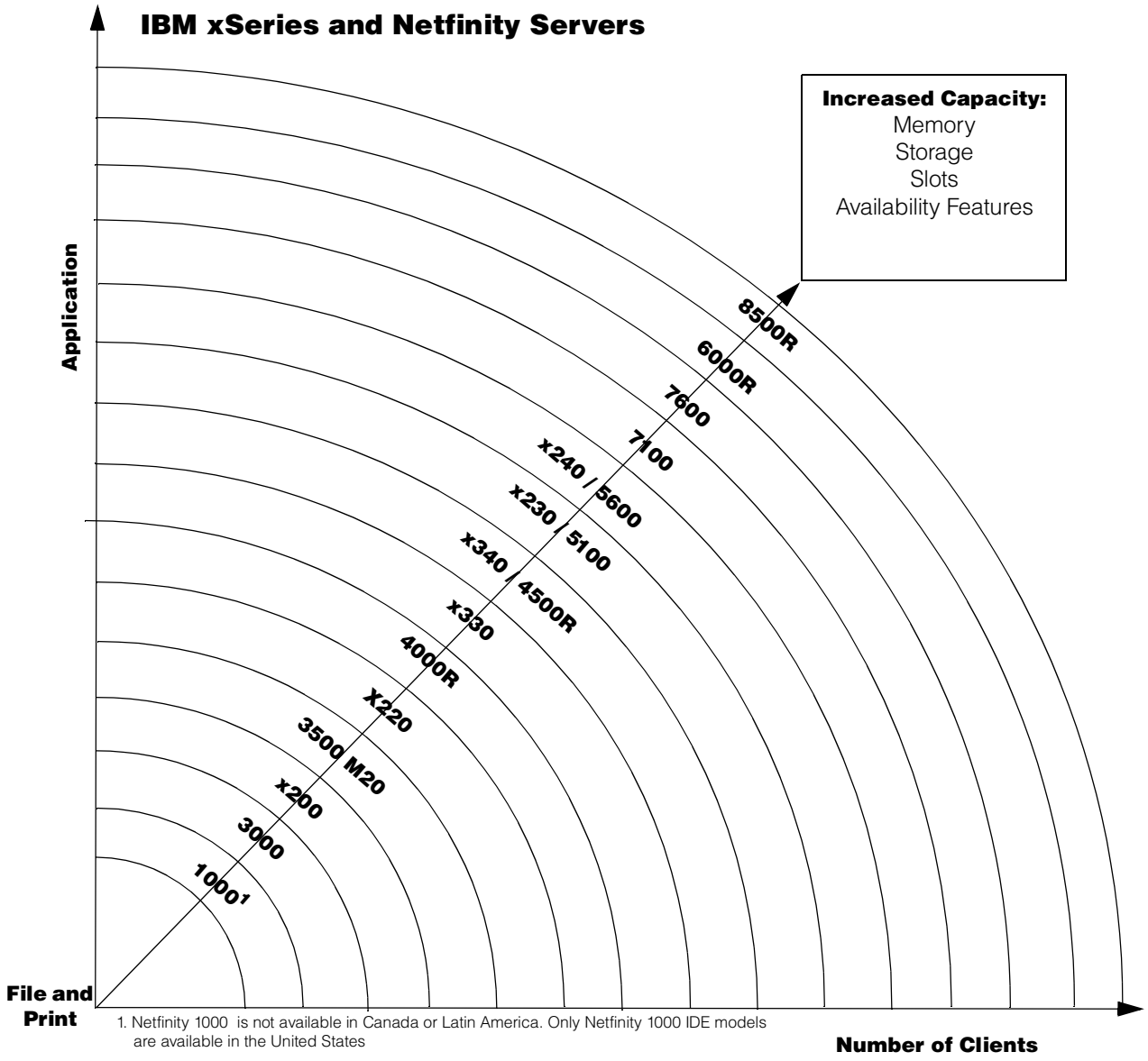
The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

Server Product Positioning



1. Netfinity 1000 is not available in Canada or Latin America. Only Netfinity 1000 IDE models are available in the United States

When in a competitive situation, this table suggests the appropriate IBM Netfinity server to bid against other vendors' equipment. However, as an IBM business partner, you may determine that customer specific requirements may make an alternative IBM solution a better choice

	Value	Price Performance	Mission Critical	Rack Optimized
8-way			**IBM**: Netfinity 8500R **Compaq**: ProLiant 8000 **Dell**: No Offering **HP**: NetServer LH 6000, LT6000R	**IBM**: Netfinity 8500R **Compaq**:ProLiant 8500 **Dell**: PowerEdge 8450 **HP**: NetServer LXr 8000
4-way		**IBM**: Netfinity 7100 **Compaq**: ProLiant 5500 / ML570 **Dell**: PowerEdge 6400 **HP**: NetServer LH4	**IBM**: Netfinity 7600 **Compaq**: No Offering **Dell**: No Offering **HP**: NetServer LXr 8000	**IBM**: Netfinity 6000R **Compaq**: ProLiant 6400 / DL580 **Dell**: PowerEdge 6450 **HP**: NetServer LH4r
2-way	**IBM**: xSeries 220 / Netfinity 3500 M20 **Compaq**: ProLiant ML350 **Dell**: PowerEdge 1300 **HP**: NetServer E60	**IBM**: xSeries 230 / Netfinity 5100 **Compaq**: ProLiant ML370 **Dell**: PowerEdge 2400 **HP**: NetServer LC2000	**IBM**: xSeries 240 / Netfinity 5600 **Compaq**: ProLiant ML530 **Dell**: PowerEdge 4400 **HP**: NetServer LH 3000	**IBM**: xSeries 330, 340, Netfinity 4000R, 4500R **Compaq**: ProLiant DL380, DL360 **Dell**: PowerEdge 2450 **HP**: NetServer LPr
Uni	**IBM**: xSeries 200 / Netfinity 1000[1] **Compaq**: ML330 **Dell**: No Offering **HP**: No Offering	**IBM**: Netfinity 3000 **Compaq**: ProLiant 400 **Dell**: No Offering **HP**: No Offering		

1. Netfinity 1000 is not available in Canada or Latin America. Only Netfinity 1000 IDE models are available in the United States

IBM xSeries and Netfinity Selection Guide

This graph represents general guidelines for selecting the appropriate server based on the number of users that can be supported in a particular application environment. This chart is for general guidance since each customer environment is unique and is unlikely to be precisely represented by any of the specific applications in the chart, but by using the chart, a reasonable approximation can be derived. External Storage Units are utilized when internal capacities are exceeded. Utilize the chart by following the steps outlined on the following page. These are not published benchmark results. Access http://www.ibm.com/pc/us/techlink/srvperf.html to obtain benchmark data.

Application/ Expectation of Maximum # of Users		**Netfinity 1000(IDE)[3] Uni-Pentium III 700 MHz/ 256 KB**	**Netfinity 1000[3] Uni-Pentium III 700 MHz/ 256 KB**	**Netfinity 3000 Uni-Pentium III 700 MHz/256 KB**	**xSeries 200 Uni-Pentium III 866MHz/ 256K**	**Netfinity 3500 M20 Dual Pentium III 800 MHz/ 256 KB**	**xSeries 220 Dual Pentium III 933MHz/ 256KB**
DB Transaction Processing Select, Update and Delete; Does not include image or Decision Support	**# of Users**	**50**	**1050**	**1125**	**1280**	**1950**	**1325**
	# of processors	1	1	1	1	2	1
	Memory (MB)	384	768	768	768MB	1 to2 GB	768MB
	# Hard Disk Drives	3	4 to 8	12 to 18	12 to 18	36 to 48	12 to 18
	# RAID Adapters	≥ 1 SCSI	≥ 1 SCSI	≥ 1 SCSI	≥1 SCSI	≥1	≥1
	#Network Connections	1	1	1	1	1	1
File and Print Application is stored locally. (For server stored applications - cut number of users in half).	**# of Users**	**100**	**500**	**1000**	**1000**	**2000**	**1000**
	# of Processors	1	1	1	1	2	1
	Memory (MB)	512	768	768	768	1 to 2 GB	768MB
	# Hard Disk Drives	3	4 to 8	4 to 8	4 to 8	16 to 24	4 to 8
	# RAID Adapters	-	≥ 1 SCSI	≥ 1 SCSI	≥ 1 SCSI	1 to 2	1
	# 100Mbps Ethernet Connections	≥ 2	≥ 2	≥ 2	≥2	4	4
Lotus Notes 10% Power Users 40% Mail 50% Mail & DB	**# of Users**	**100**	**565**	**675**	**740**	**1800**	**735**
	# of Processors	1	1	1	1	2	1
	Memory (MB)	384	768	768	1 GB	2 GB	768MB
	# Hard Disk Drives	3	4 to 8	4 to 8	4 to 8	16 to 20	4 to 8
	# RAID Adapters	-	≥ 1 SCSI	≥ 1 SCSI	≥ 1 SCSI	1	1
	# Network Connections	≥ 1	≥ 1	≥ 1	≥1	≥2	≥2
Microsoft Exchange Server 5.5 100% Med Usersl 30 MB Mailbox	**# of Users**	**600**	**700**	**700**	**1980**	**850**	**2200**
	# of Processors	1	1	1	2	1	2
	Memory (MB)	256	256	384	1 GB	512	1 GB
	# Hard Disk Drives	3	3 to 4	3 to 4	9	3 to 4	10
	# RAID Adapters	-	≥ 1 SCSI	≥ 1 SCSI	1	≥ 1 SCSI	≥ 1 SCSI
	# Network Connections	≥1	≥1	≥1	≥1	≥1	≥1
SAP 3-Tier Distributed Ver 4.0b Processing Sales and Distribution Application (Minimum of 16-20 Servers)	**# of Users**	-	-	-	-	-	-
	# of Processors	-	-	-	-	-	-
	Memory (MB)	-	-	-	-	-	-
	# Hard Disk Drives	N/A	N/A	N/A	N/A	N/A	N/A
	# RAID Adapters	-	-	-	-	-	-
	# Network Connections	-	-	-	-	-	-
SAP Central Version 4.0b Processing Sales and Distribution Application (One Server)	**# Users**	-	-	-	**75**	**139**	**80**
	# Processors	-	-	-	1	2	1
	Memory (MB)	-	-	-	1 GB	1 GB	1 GB
	# Hard Disk Drives	N/A	N/A	N/A	12	12 to 24	12
	# RAID Adapters	-	-	-	≥1	≥1	≥1
	# Network Connections	-	-	-	1	1	1
High Availability Features	Hot-Swap HDD Bays	-	-	-	-	-	-
	Hot-Plug PCI Slots	-	-	-	-	-	-
	Hot-Swap Power	-	-	-	-	-	-
	Hot-Swap Fans	-	-	-	-	-	-
	RAID	-	Opt.	Opt.	Opt.	Opt.	Opt.
	Clustering Support	-	-	-	-	-	-
	Sys. Mgt. Processor	-	Opt.	Opt.	-	Opt.	Opt.
Other Distinquishing Features	Max # Processors	1	1	1	2	1	1
	Max Memory	768MB	768MB	768MB	2 GB	768MB	768MB
	Max Int. Storage (GB)	30.3**	145.6	145.6	145.6	145.6	145.6
	Max Int. Storage (GB) with Int. Tape drive	30.3	109.2	109.2	145.6	109.2	109.2
	Available PCI Slots	3	2	2	5	5	5
	19" Rack Models	-	-	-	-	-	-
	NetBAY3x Support	-	-	-	-	-	-

IBM xSeries and Netfinity Selection Guide

Application/ Expectation of Maximum # of Users		xSeries 330 Dual Pentium III 1 GHZ/ 256KB	xSeries 340 / Netfinity 4500R Dual Pentium III 1 GHz/ 256 KB	xSeries 230 / Netfinity 5100 Dual Pentium III 1 GHz/ 256 KB	xSeries 240 / Netfinity 5600 Dual Pentium III 1 GHz/ 256 KB	Netfinity 6000R Quad Pentium III Xeon 700 MHz/2 MB	Netfinity 7100 Quad Pentium III Xeon 700 MHz/ 2 MB	Netfinity 7600 Quad Pentium III Xeon 700 MHz/ 2MB	Netfinity 8500R Eight-Way Pentium III Xeon 700 MHz/ 2 MB
DB Transaction Processing Select, Update and Delete; Does not include image or Decision Support	**# of Users**	**2170**	**2720**	**2720**	**3650**	**6420**	**6420**	**6420**	**10,315**
	# of processors	2	2	2	2	4	4	4	8
	Memory (MB)	1 to 2 GB	2 to 3 GB	2 to 3 GB	4 GB	4 GB	4 GB	4 GB	4 GB
	# Hard Disk Drives	36 to 48	48 to 64	48 to 64	80 to 140	80 to 140	80 to 140	80 to 140	180 to 250
	# RAID Adapters	≥2	≥2	≥2	≥3	≥4	≥4	≥4	≥5 or Fibre
	#Network Connections	1	1	1	2 to 3	2 to 3	2 to 3	2 to 3	2 to 3
File and Print Application is stored locally. (For server stored applications - cut number of users in half).	**# of Users**	**2100**	**2100**	**2100**	**2100**	**5000**	**5000**	**5000**	**6000**
	# of Processors	2	2	2	2	2	2	2	3-4
	Memory (MB)	1 to 2 GB	1 to 2 GB	1 to 2 GB	1 to 2 GB	2 to 4 GB	2 to 4 GB	2 to 4 GB	4 GB
	# Hard Disk Drives	20 to 30	20 to 30	20 to 30	20 to 30	50 to 90	50 to 90	50 to 90	75 to 150
	# RAID Adapters	1 to 2	1 to 2	1 to 2	1 to 2	≥ 4	≥ 4	≥ 4	≥4 or Fibre
	# 100Mbps Ethernet Connections	4	4	4	4	8	8	8	10
Lotus Notes 10% Power Users 40% Mail 50% Mail & DB	**# of Users**	**2000**	**2110**	**2110**	**2110**	**4215**	**4215**	**4215**	**6695**
	# of Processors	2	2	2	2	4	4	4	8
	Memory (MB)	2 GB	2 to 3 GB	2 to 3 GB	2 to 3 GB	3 GB	3 GB	3 GB	4 GB
	# Hard Disk Drives	20 to 30	20 to 30	20 to 30	20 to 30	20 to 30	20 to 30	20 to 30	30 to 40
	# RAID Adapters	1 to 2	1 to 2	1 to 2	1 to 2	2 to 3	2 to 3	2 to 3	≥3
	# Network Connections	≥2	≥2	≥2	≥2	≥3	≥3	≥3	≥4
Microsoft Exchange Server 5.5 100% Med Users 30 MB Mailbox	**# of Users**	**2310**	**2310**	**2310**	**2310**	**6400**	**6600**	**7000**	**8000**
	# of Processors	2	2	2	2	4	4	4	8
	Memory (MB)	2 GB	2 GB	2 GB	2 GB	3 GB	≥3 GB	4 GB	4 GB
	# Hard Disk Drives	10	9	12	12	30	30 to 40	40 to 50	40 to 50
	# RAID Adapters	1	1	1	2	2	≥2	≥3	≥3
	# Network Connections	≥2	≥1	≥1	≥1	≥2	≥2	≥2	≥2
SAP 3-Tier Distributed Ver 4.x Processing Sales and Distribution Application (Minimum of 16-20 Servers)	**# of Users**			**2790**	**2800**	**4300**	**3150**	**3350**	**5100**
	# of Processors			2	2	4	4	4	8
	Memory (MB)			1 to 2 GB	1 to 2 GB	≥4GB	≥4 GB	≥4 GB	≥4 GB
	# Hard Disk Drives	N/A	N/A	24 to 36	24 to 36	48 to 60	48 to 60	48 to 60	48 to 60
	# RAID Adapters			≥2	≥2	≥3	≥3	≥3	≥3
	# Network Connections			1	1	1	1	1	1
SAP Central Version 4.x Processing Sales and Distribution Application (One Server)	**# Users**	**160**	**160**	**162**	**180**	**312**	**245**	**245**	**375**
	# Processors	2	2	2	2	4	4	4	8
	Memory (MB)	1 GB	1 GB	1 to 2 GB	1 to 2 GB	≥2 GB	≥2 GB	≥2 GB	≥4 GB
	# Hard Disk Drives	12 to 24	12 to 24	12 to 24	12 to 24	24 to 36	24 to 36	24 to 36	24 to 36
	# RAID Adapters	≥1	≥1	≥1	≥1	≥2	≥2	≥2	≥2
	# Network Connections	1	1	1	1	1	1	1	1
High Availability Features	Hot-Swap HDD Bays	-	X	X	X	X	X	X	X
	Hot-Plug PCI Slots	-	-	-	X	X	Opt.	X	X
	Hot-Swap Power	-	X	Opt	X	X	X	X	X
	Hot-Swap Fans	-	X	-	X	X	X	X	X
	RAID	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	X	Opt.
	Clustering Support	-	X	X	X	-	X	X	X
	Sys. Mgt. Processor	-	X	X	X	X	X	X	X
Other Distinquishing Features	Max # Processors	2	2	2	2	4	4	4	8
	Max Memory (GB)	2 GB	4 GB	4 GB	4 GB	16 GB	16 GB	16 GB	32 GB
	Max Int. Storage (GB)	72.8	218.4	218.4	218.4	218.4	364	364	72.8
	Max Int. Storage (GB) with Int. Tape drive	N/A	109.2	218.4	218.4	N/A	364	364	N/A
	Available PCI Slots	2	5	5	5	6	6	5	12
	19" Rack Models	-	X	X	X	X	X	X	X
	NetBAY3x Support	-	-	-	-	-	X	X	X^2

1. With a single Netfinity EXP200 storage unit installed in the standard NetBAY3 included with tower models.
2. With a Rack-to-Tower Conversion Kit installed.
3. Netfinity 1000 is not available in Canada or Latin America. Only Netfinity 1000 IDE models are available in the United States.

Procedure for Server Selection Guidance Chart

File and Print numbers are Novell Netware-based with all others based on Microsoft Windows NT. Other Networking Operating System (NOS) results could vary.
Extensive SAP sizings are available from IBM/SAP Competency Centers. Contact your IBM Marketing Representative for additional information**.**

Step 1: Determine which application (row) most closely represents the customer's environment.
Step 2: Move from left to right along the row (chosen in Step 1) noting which columns contain numbers that are equal to or greater than the maximum customer's planned number of users.
Step 3: Move up the columns (chosen in Step 2) to the top row to determine which IBM Netfinity or PC Servers should be considered as possible solutions.
Step 4: Evaluate other features such as storage, memory capacity, high availability components, number of available expansion slots, etc., which are unique to each server, in order to determine which is the most appropriate to recommend.
For your reference, configuration information corresponding to the number of users is also provided.

IBM xSeries 200

Part Number	Processor Speed (MHz)	Number of Processors (Std/Max)	L2 ECC Cache. (KB)	Memory (Std/Max) (R=RDIMM)	Form Factor	Power Supply Quantity (Std/Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std/Max)	CD-ROM (IDE)	Bays: (Total/Avail)	Slots (Total/Avail)
xSeries 200 At-A-Glance																
8478-10X	667[1]	1/1	128	128MB/1.5GB	Tower	1/1	-	-	-	10/100	U160	4/2	0/145.6GB	48X-20X	7/5	5/4
8478-11X	667[1]	1/1	128	64MB/1.5GB	Tower	1/1	-	-	-	10/100	IDE	4/2	15/145.6GB[2]	48X-20X	7/4	5/5
8478-12X[3]	667[1]	1/1	128	64MB/1.5GB	Tower	1/1	-	-	-	10/100	IDE	4/1	15/145.6GB[2]	48X-20X	7/3[3]	5/5
8478-13X[4]	667[1]	1/1	128	128MB/1.5GB	Tower	1/1	-	-	-	10/100	U160	4/2	9.1/145.6GB[2]	48X-20X	7/4	5/4
8478-40X	800[5]	1/1	256	128MB/1.5GB	Tower	1/1	-	-	-	10/100	U160	4/2	0/145.6GB	48X-20X	7/5	5/4
8478-41X	800[5]	1/1	256	64MB/1.5GB	Tower	1/1	-	-	-	10/100	IDE	4/2	15/145.6GB[2]	48X-20X	7/4	5/5
8478-42X[4]	800[5]	1/1	256	128MB/1.5GB	Tower	1/1	-	-	-	10/100	U160	4/2	9.1/145.6GB[2]	48X-20X	7/4	5/4
8478-50X	866[5]	1/1	256	128MB/1.5GB	Tower	1/1	-	-	-	10/100	U160	4/2	0/145.6GB	48X-20X	7/5	5/4
8478-51X	866[5]	1/1	256	64MB/1.5GB	Tower	1/1	-	-	-	10/100	IDE	4/2	15/145.6GB[2]	48X-20X	7/4	5/5
8478-52X[4]	866[5]	1/1	256	128MB/1.5GB	Tower	1/1	-	-	-	10/100	U160	4/2	9.1/145.6GB[2]	48X-20X	7/4	5/4

1. Intel Celeron processor.
2. Maximum capacity assumes replacement of standard hard disk drives and tape drives with the largest supported IBM hard disk drive.
3. This model is configured with an IBM 10/20GB TR5 Internal IDE Tape Drive (P/N 20L0549).
4. Not available in the United States.
5. Intel Pentium III processor with advanced transfer (full speed) L2 cache and 133 MHz front-side bus (FSB).

xSeries 200 Processors

Part Number	Processor Upgrades 256 KB Advanced Transfer Cache	Processor Speed Upgrade[1]
21P9539	800 MHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	All 1xX
10K3818	866 MHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	All 1…4xX

1.Requires removal of the standard processor. A maximum of one processor may be installed. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine type "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".

xSeries 200 Memory

DIMM Socket
DIMM Socket
DIMM Socket

Part Number	Memory Description
33L3079	64MB 133MHz ECC SDRAM DIMM Memory
33L3081	128MB 133MHz ECC SDRAM DIMM Memory
33L3083	256MB 133MHz ECC SDRAM DIMM Memory
33L3085	512MB 133MHz ECC SDRAM Unbuffered DIMM Memory

Total System Memory (Standard Models)[1]		DIMMs			
64 MB (1 x 64)	128 MB (1 x 128)	64 MB (33L3079)	128 MB (33L3081)	256 MB (33L3083)	512 MB (33L3085)
128 MB	192 MB	1			
192 MB	256 MB	2 or	1		
320 MB	384 MB	-	2 or	1	
384 MB[2]	-		3		
576 MB	640 MB			2 or	1
768 MB[2]	768 MB[2]			3	
1088 MB	1152 MB				2
1536 MB (max)[2]	1536 MB[2]				3

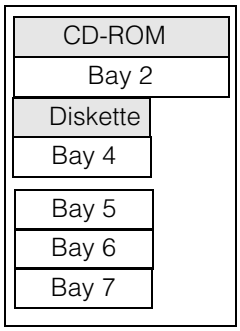
This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller DIMMs may provide a more cost-effective alternative to using larger DIMMs. Select the desired total memory from the appropriate column (Standard Model 64MB or 128MB), then select a quantity in that row from one of the DIMM columns.

1. Network Operating Systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. Requires removal of standard DIMMs.

xSeries 200 Hard Disk Drive (HDD) and External Storage

Total Internal Storage[1]	7200RPM SCSI Hard Disk Drives (HDDs)			10,000 RPM SCSI Hard Disk Drives (HDDs)		
	9.1 GB (P/N 00N8204)	18.2 GB (P/N 00N8205)	36.4 GB (P/N 00N8206)	9.1 GB (P/N 00N8207)	18.2 GB (P/N 00N8208)	36.4 GB (P/N 00N8209)
0 GB	Standard on Some Base Models			Standard on Some Base Models		
9.1GB	1 (Std on some models)	-	-	1	-	-
18.2GB	2	1	-	2	1	-
27.3GB	3	-	-	3	-	-
36.4GB	4	2	1	4	2	1
54.6GB	-	3	-	-	3	-
72.8GB	-	4	2	-	4	2
109.2GB	-	-	3	-	-	3
145.6GB (max)	-	-	4	-	-	4

This table does not represent all possible hard drive configurations.
1. Select a total storage row then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within ± 0.2 GB unless otherwise noted.



Total Internal Storage[1]	7200RPM IDE Hard Disk Drives (HDDs)[2]		
	15 GB (P/N 19K4460)	20.4 GB (P/N 19K4461)	30 GB (P/N 00N8203)
15GB	1 (Std on EIDE models)	-	-
20.4GB	-	1	-
30GB	2	-	1
40.8GB	-	2	-
45 GB	3[3]	-	-
60GB	-	-	2
61.2GB	-	3[3]	-
90GB (max)	-	-	3[3]

This table does not represent all possible hard drive configurations.

1. Select a total storage row and then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within ±0.2 GB unless otherwise noted.
2. The xSeries 200 EIDE controllers support a maximum of four IDE devices per machine including CD-ROM drives, hard disks and IDE tape drives.
3. Not a supported configuration on model 12X which includes an IBM 10/20 GB TR5 Internal IDE Tape Drive (P/N 20L0549).

Bay	Form Factor	Height	Front Access	Usage
1	133 mm (5.25")	HH	yes	IDE CD-ROM
2	133 mm (5.25")	HH	yes	open[1, 2]
3	89 mm (3.5")	SL	yes	Diskette
4	89mm (3.5")	SL	yes	open
5…7	89mm (3.5")	SL	yes	open

1. Supports removable media devices only. Hard drives are not supported.
2. Tape drive in model 8478-12X.

Part Number	Description	RPM	Height	Bays Supported	Max. Qty
	IDE Hard Disk Drives (HDD)[1, 2]				
19K4460	15GB 7200 rpm ATA/100 (EIDE) HDD	7200	SL	4…7	3[3]
19K4461	20.4GB 7200 rpm ATA/100 (EIDE) HDD	7200	SL	4…7	3[3]
00N8203	30GB 7200 rpm ATA/100 (EIDE) HDD	7200	SL	4…7	3[3]
	Ultra160 Hard Disk Drives (HDD)[2]				
00N8204	9.1GB 7200 rpm Ultra160 SCSI HDD	7200	SL	4…7	4
00N8205	18.2GB 7200 rpm Ultra160 SCSI HDD	7200	SL	4…7	4
00N8206	36.4GB 7200 rpm Ultra160 SCSI HDD	7200	SL	4…7	4
00N8207	9.1GB 10,000 rpm Ultra160 SCSI HDD	10,000	SL	4…7	4
00N8208	18.2GB 10,000 rpm Ultra160 SCSI HDD	10,000	SL	4…7	4
00N8209	36.4GB 10,000 rpm Ultra160 SCSI HDD	10,000	SL	4…7	4
	External Storage Expansion Units[4]	**Form Factor**			
35301RU	Netfinity EXP200 Storage Expansion Unit[5]	Rack (3U)			
37L5857	Netfinity EXP200 Rack-to-Tower Conversion Kit	-			
37L0075	Netfinity EXP200 350 W Redundant Power Supply	-			
35311RU	EXP300 Storage Expansion Unit[6]	Rack (3U)			
09N7296	EXP300 Rack-to-Tower Conversion Kit	-			

1.The xSeries 200 EIDE controllers support a maximum of four IDE devices per machine including CD-ROM drives, hard disks and IDE tape drives.
2. Mixing of IDE and SCSI hard disk drives is not supported.
3. Limited to 2 drives in model -12X due to installed tape drive option.
4. Not supported by the external SCSI port included in SCSI models. Select an optional SCSI controller then refer to Appendix D: Cables-Storage Units-Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
5. Netfinity EXP200 includes a single 2 M Ultra2 SCSI cable and a single hot-swap 350W power supply and power cord. Optional hot-swap Netfinity EXP200 350W Redundant Power Supply (P/N 37L0075) includes an additional power cord. To convert an EXP200 to match the system's tower form factor, Netfinity EXP200 Rack-to-Tower Conversion Kit (P/N 37L5857) is required.
6. EXP300 includes a single 2M Ultra2 SCSI cable and dual hot-swap 500 W redundant power supplies, each with its own power cord. To convert an EXP300 to a tower form factor, EXP300 Rack-to-Tower Conversion Kit (P/N 09N7296) is required.

xSeries 200 Internal SCSI Cabling

EIDE Models
In xSeries 200 models using the EIDE interface for storage device attachment, a two-drop cable is used to attach the standard 15 GB EIDE HDD to one of the EIDE connectors. A second EIDE controller provides the interface for the IDE CD-ROM drive. A two-drop cable connects the IDE controller to the IDE CD-ROM. Up to two additional EIDE or IDE devices can be installed (one off of each controller).

SCSI Models
xSeries 200 models with a SCSI adapter are cabled internally with a five-drop, 16-bit wide LVD SCSI cable with a built-in multi-mode active terminator at one end of the cable. The other end of the cable is attached to the internal 68-pin connector of the standard Ultra160 SCSI adapter. SCSI devices can be connected to any of the five cable connectors. If 8-bit (narrow) devices are to be installed, a 68- to 50-pin converter (32G3925) is required for each narrow device.

Other Configuration Alternatives
In the case where a RAID controller is used to support internal drives in a xSeries 200, the standard cable is moved from the onboard controller to the RAID adapter. To connect a tape drive to the onboard or other supported SCSI controller, use the 16-bit multi-mode terminated, two-drop, SCSI cable included with optional Media Bay Tray and LVD Cable Kit (P/N 10K2340).

External SCSI support can be obtained by installing an optional SCSI adapter or RAID controller and using appropriate external SCSI cabling.

xSeries 200 I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported[1]
	Storage Controllers[2]			
37L6091	ServeRAID-4L Ultra160 SCSI Controller[3]	Full	32-bit	1…5
37L6080	ServeRAID-4M Ultra160 SCSI Controller[4]	Full	32/64-bit	1…5
19K4646	PCI Wide Ultra160 SCSI Adapter[7]	Half	32-bit	1…5
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	1…5
	Networking[5]			
	Ethernet			
09N9901	10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1…5
34L0301	Netfinity Gigabit Ethernet SX Adapter	Half	32/64-bit	1…5
19K4401	Netfinity Gigabit Ethernet Adapter	Half	32/64-bit	1…5
34L4601	Netfinity 10/100 Ethernet Security Adapter	Half	32/64-bit	1…5
	Token Ring			
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN	Half	32-bit	1…5
34L5001	16/4 Token-Ring PCI Management Adapter	Half	32-bit	1…5
	Communications[6]			
33L4618	PCI V.90 56 Data/Fax Modem	Half	32-bit	1…5
37L14xx	Serial I/O SST 8, 16 and 128 Port Adapters	Half	32-bit	1…5

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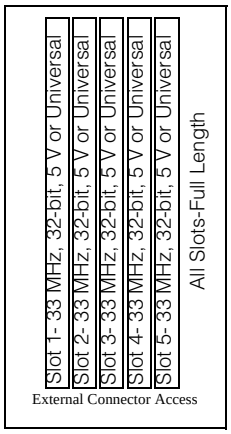

Slot 1- 33 MHz, 32-bit, 5 V or Universal
Slot 2- 33 MHz, 32-bit, 5 V or Universal
Slot 3- 33 MHz, 32-bit, 5 V or Universal
Slot 4- 33 MHz, 32-bit, 5 V or Universal
Slot 5- 33 MHz, 32-bit, 5 V or Universal
All Slots-Full Length
External Connector Access

1. The xSeries 200 has five full-length, 33 MHz PCI expansion slots. The number of available slots is model specific.
2. Some models of the xSeries 200 include a single channel Ultra160 SCSI Adapter with a five drop multi-mode terminated LVD SCSI Cable. All other models include dual-channel EIDE controllers and require an optional SCSI adapter for SCSI functionality. See At-A-Glance for model attributes
3. ServeRAID-4L Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8-mm VHDCI.
4. ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two external 0.8-mm VHDCI Ultra160 connectors.
5. xSeries 200 includes an integrated full-duplex, 10.100 Mbps Ethernet controller.
6. xSeries 200 includes two USB ports, two high-speed serial/asynchronous ports, (NS16550A software compatible) and one high-speed parallel port supporting devices using SSP/EPP/ECP protocols adhering to the IEEE 1284 Standard.
7. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilized.

xSeries 200 Power, Monitor & Accessories

Part Number	Description
	Power[1]
	Free Standing Uninterruptible Power Supply (UPS)[2]
94G3134	APC Smart-UPS 700
94G3135	APC Smart-UPS 1000
94G3136	APC Smart-UPS 1400
	Rack Mount Uninterruptible Power Supply (UPS)[2]
94G6674	APC Smart-UPS 1400RMB[3]
94G6676	APC Smart-UPS 3000RMB[3]
37L6861	APC Smart-UPS 5000RMB[4]
	Monitors[5]
633347N	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
6331B2N	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
6332J1N	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[6]
66274AN	G78 Color Monitor 17" (406.4mm, 16.0" Viewable Image Size), stealth black[6]
9511AG1	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable Image Size), stealth black[7]
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit II

1. The xSeries 200 includes a 330 W voltage sensing power supply and a single line cord..
2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
3. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
4. Height is 5U. See "Rack and NetBAY" for supported IBM racks.
5. The xSeries 200 contains a S-3 Savage-4 LT video adapter with 8Mb of video memory plugged into the standard AGP slot.
6. Installation within a rack requires optional Monitor Compartment (P/N94G7444).
7. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit II (P/N 37L6888) and Netfinity Rack Keyboard Tray (P/N 28L4707). A space saver keyboard may coexist within the same 28L4707 keyboard tray.

Part Number	Description
	Conversion Kits
09N4300	4Ux20D Tower-to-Rack Kit
	Rack and NetBAY[1]
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack
9306910	Netfinity Rack (Perforated Doors)
36L9703	Netfinity Rack Extension Kit
9306200	Netfinity NetBAY22
36L9702	NetBAY22 Rack Extension Kit
	Keyboard and Mouse[2]
28L3644	Space Saver II Keyboard[3, 4]
01K1260	TrackPoint IV 104-key Black Keyboard[4, 5]
28L3621	Preferred Keyboard (stealth black)[5]
28L3673	Sleek 2-button Stealth Black Mouse

1 Rack installation of an xSeries 200 requires 4Ux20D Tower-to-Rack Kit (P/N 09N4300) and one of the racks listed here. See IBM Netfinity Rack Cabinet and Options section for IBM rack supported devices.
2. The xSeries 200 includes both a mouse and non-space saver keyboard.
3. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
4. Advanced TrackPoint IV features are not available on IBM Netfinity systems.
5. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.

xSeries 200 Tape Options

Part Number	Description	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures[1]
20L0549	10/20GB TR5 Internal IDE Tape Drive[2]	2, 4	-	101.6mm (3.5" SL or 133mm (5.25") HH	-	-	-
09N4041	12/24GB DDS/3 4-mm Internal SCSI Tape Drive[3, 4]	2	8	89 mm (3.5") HH or 133 mm (5.25") HH	Y	Y	3510020, 3551001
09N4042	10/20GB NS Internal SCSI Tape Drive[3, 4]	2, 4	8	89 mm (3.5") SL or 133 mm (5.25") HH	Y	Y	3510020, 3551001
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive[4, 5]	2	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	Y	N/A	3510020, 3551001[6]
	External Tape Enclosures						
3510020	External Half High SCSI Storage Enclosure[7]	-	8/16	Desktop	N	N	-
3551001	NetMEDIA Storage Expansion Unit EL[8]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[9]	-	16 LVD	-	N	N	3551001
	Associated Options						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	External	Y	N	3510020, 3503B0X
10K2340	Media Bay Tray and LVD Cable Kit[10]	-	16 LVD	Internal	Y	N	3551001

Note: SCSI models include an Ultra160 SCSI controller with a five-drop multi-mode terminated LVD SCSI cable. Single-Ended devices attached to this cable will limit the entire SCSI bus to single- ended performance. SCSI tape drives and external tape enclosures are supported by PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which includes a five-drop multi-mode LVD SCSI cable and an external 0.8-mm VHDCI connector.

1. To determine cable requirements, note the tape drive's SCSI interface, the appropriate SCSI controller from the system configurator section, and the desired enclosure, then refer to Appendix D: Cables - Storage Units - Controllers.
2. SCSI models include a two-drop EIDE cable for attachment to the CD-ROM and an IDE tape drive. Model 8478-12X includes 10/20GB TR5 Internal IDE Tape Drive (P/N 20L0549).
3.This single-ended device will limit the SCSI bus to which it is attached to Ultra SCSI speeds. To provide a dedicated tape SCSI bus, install PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which includes a five-drop multi-mode LVD SCSI cable.
4. RAID configurations (SCSI models only) where the standard SCSI cable is attached to a RAID adapter, require the two-drop multi-mode terminated LVD SCSI cable included with Media Bay Tray and LVD Cable Kit (P/N 10K2340).
5. EIDE models require optional PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which includes a five-drop multi-mode LVD SCSI cable.
6. LVD support for LVD devices installed in a NetMEDIA Storage Expansion Unit EL (P/N 3551001) requires replacement of the standard single-ended internal cables with one or more (depending on configuration) cables from Media Bay Tray and LVD Cable Kit (P/N 10K2340) which contains a single two-drop mult-mode terminated LVD cable. If the standard cables are used for attachment to LVD devices, single-ended SCSI rules and bus speeds apply.
7. Provides a black desktop 133 mm (5.25") half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
8. NetMEDIA Storage Expansion Unit EL (P/N 3551001) is a black 3U, 19" rack or NetBAY3/3E mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included.
9. NetMEDIA Systems Management Adapter (P/N 10L7113) may be installed in a 3551001 to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the 3551001 is powered off. External connector is 0.8-mm VHDCI.
10. Media Bay Tray and LVD Cable Kit (P/N 10K2340) includes an internal two-drop multi-mode terminated LVD SCSI cable.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes

xSeries 200 Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

Internet Server

Part Number	Description	Quantity
8478-12X	x200 Celeron 667/128, 64MB, EIDE, 15GB, Tape, 48X	1
33L3081	128 MB 133Mhz ECC SDRAM DIMM Memory[1]	1
19K4461	20.4 GB 7200 rpm ATA/100 (EIDE) HDD[2]	1
6331B2N	E54 Color Monitor 15" (350 mm, 13.8" Viewable Image Size), stealth black	1
94G3134	APC Smart-UPS 700	1

1. For a total of 192 MB of system memory.
2. For a total of 35.4 GB of internal storage.

An Internet server is a server that handles all requests from the Internet (Intranet or Extranet). Usually, this type of server has the same characteristics as a normal file server. The main difference is that an internet server talks a different language (TCP/IP vs. NETBEUI or IPX/SPX) and often needs to do an extra security check (firewall). In the case of an Internet server, the server itself talks mostly to just one client, the Internet Service Provider (ISP), instead of many clients like a file server does.

With this is mind, the the xSeries 200 was selected to provide an affordable price point for the growing Internet server market with two-way Pentium III processing, 192 MB of system memory (expandable to 1.5 GB), and power protection with an APC Smart-UPS.

The network configuration depends on the method that will be used to connect the server to the Internet. Usually fast Ethernet routers are used, but if other methods are used you can add the appropriate adapter. The configuration includes a tape backup unit for secure backup of critical data in the event of a system or storage failure.

File and Print Server

Part Number	Description	Quantity
8478-50X	x200 Pentium III 866/256, 128MB, Ultra160, Open, 48X	1
33L3081	128 MB 133 MHz ECC SDRAM DIMM Memory[1]	1
00N8208	18.2 GB 10,000 RPM Ultra160 SCSI HDD[2]	1
00N7991	20/40GB DDS/4 4-mm Internal Tape Drive	1
65464AN	G54 Color Monitor 15" (348 mm, 13.7" Viewable Image Size), stealth black	1
94G3134	APC Smart-UPS 700	1

1. For a total of 256 MB of system memory.
2. For a total of 54.6 GB of internal storage.

A small business or departmental server is usually required to perform all typical server functions while servicing up to 100 users in a normal workgroup computing environment, but doesn't require the high-end performance and fault-tolerance properties of larger servers.

The sample configuration above consists of an xSeries 200 with 256 MB of memory and 54.6 GB of hard disk space. It has enough processor power and memory to run most current network operating systems comfortably and enough hard disk drive space to store a significant amount of data with additional external storage expansion still available. Demanding network traffic is effectively handled by the standard 100 Mbps Ethernet connection.

This configuration also includes a tape backup unit, monitor, and a UPS to keep the system protected during power surges and outages.

Application Server

Part Number	Description	Quantity
8478-40X	x200 Pentium III 800/256, 128MB, Ultra160, Open, 48X	1
33L3083	256 MB 133 MHz ECC SDRAM DIMM Memory[1]	1
37L6091	ServeRAID-4L Ultra160 SCSI Controller	1
00N8207	9.1 GB 10,000 rpm Ultra160 SCSI HDD[2]	
10K2340	Media Bay Tray and LVD Cable Kit[3]	3
09N4042	10/20 GB NS Internal SCSI Tape Drive	1
6331B2N	E54 Color Monitor 15" (350 mm, 13.8" Viewable Image Size), stealth black	1
94G3134	APC Smart-UPS 700	1

1. For a total of 384 MB of system memory.
2. For a total of 27.3 GB of internal storage.
3. Cable for dedicated attachment of tape to standard controller.

An application server differs from a file and print server in that it has a higher workload, in providing application serving requirements for users. With this in mind, the xSeries 200 was selected to provide an affordable price point for an application server, with Pentium III processing, 384 MB of system memory (expandable to 1.5 GB), and availability features such as RAID-protected internal storage and power protection with an APC Smart-UPS.

IBM xSeries 220

Part Number	Processor Speed (MHz)[2]	Number of Processors (Std/Max)	L2 ECC Cache. (KB)	Memory (Std/Max) (R=RDIMM)	Form Factor	Power Supply Quantity (Std/Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std/Max)	CD-ROM (IDE)[1]	Bays: (Total/Avail)	Slots (Total/Avail)
xSeries 220 At-A-Glance																
8645-21X	800	1/2	256	128MB(R)/4GB	Tower	1/1	-	-	-	10/100	U160	4/2	0/145.6GB	48X-20X	7/5	5/5
8645-22X	800	1/2	256	128MB(R)/4GB	Tower	1/1	-	-	-	10/100	U160	4/2	18.2/145.6GB	48X-20X	7/4	5/5
8645-2AX	800	1/2	256	128MB(R)/4GB	Tower	1/1	H	-	-	10/100	U160	4/2	0/145.6GB	48X-20X	7/5	5/5
8645-31X	866	1/2	256	128MB(R)/4GB	Tower	1/1	-	-	-	10/100	U160	4/2	0/145.6GB	48X-20X	7/5	5/5
8645-32X	866	1/2	256	128MB(R)/4GB	Tower	1/1	-	-	-	10/100	U160	4/2	18.2/145.6GB	48X-20X	7/4	5/5
8645-3AX	866	1/2	256	128MB(R)/4GB	Tower	1/1	H	-	-	10/100	U160	4/2	0/145.6GB	48X-20X	7/5	5/5
8645-41X	933	1/2	256	128MB(R)/4GB	Tower	1/1	-	-	-	10/100	U160	4/2	0/145.6GB	48X-20X	7/5	5/5
8645-42X	933	1/2	256	128MB(R)/4GB	Tower	1/1	-	-	-	10/100	U160	4/2	18.2/145.6GB	48X-20X	7/4	5/5
8645-4AX	933	1/2	256	128MB(R)/4GB	Tower	1/1	H	-	-	10/100	U160	4/2	0/145.6GB	48X-20X	7/5	5/5

1. Intel Pentium III processor with advanced transfer (full speed) L2 cache.
2. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.

xSeries 220 Processor Upgrades

Part Number	Processor Upgrades with 512 KB Cache or 256 KB Advanced Transfer Cache	SMP Support[1]	Processor Speed Upgrade[2]
21P9539	800 MHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	All 2xX	-
10K3818	Netfinity 866 MHz with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Upgrade Processor	All 3xX	All 2xX
10K3819	Netfinity 933 MHz with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Upgrade Processor	All 4xX	All 2…3xX

1. One additional processor may be installed, providing a maximum of two. All processors must be identical in type, speed, and cache size.
2.Requires removal of the standard processor. A maximum of one processor may be installed. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine type "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".

xSeries 220 Memory

DIMM Socket
DIMM Socket
DIMM Socket
DIMM Socket

Part Number	Memory Description
33L3142	128MB 133MHz SDRAM ECC RDIMM Memory
33L3144	256MB 133MHz SDRAM ECC RDIMM Memory
33L3146	512MB 133MHz SDRAM ECC RDIMM Memory
33L3152	1 GB 133MHz SDRAM ECC RDIMM

Total System Memory[1]	Quantity of RDIMMs Added			
	128 MB (1 x 128)	128 MB (33L3142)	256 MB (33L3144)	512 MB (33L3146)	1 GB (33L3152)
256MB	1	-	-	-
384 MB	2 or	1	-	-
512 MB	3	-	-	-
640 MB	-	2 or	1	-
896 MB	-	3	-	-
1024 MB[2]	-	4[2]	-	-
1152 MB	-		2 or	1
1664 MB[2]	-		3	-
2048 MB	-		4[2]	-
2176 MB	-		-	2
3200 MB	-		-	3

4096 MB (max)	-		-	4[2]

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller DIMMs may provide a more cost-effective alternative to using larger DIMMs. Select the desired total memory from the appropriate column (Standard Model 64MB or 128MB), then select a quantity in that row from one of the DIMM columns.

1. Network Operating Systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. Requires removal of standard memory.

xSeries 220 Hard Disk Drive (HDD) and External Storage

Total Internal Storage[1]	7200RPM Hard Disk Drives (HDDs)			10,000 RPM Hard Disk Drives (HDDs)		
	9.1 GB (P/N 00N8204 or 37L7201)[2]	18.2 GB (P/N 00N8205 or 37L7202)[2]	36.4 GB (P/N 00N8206 or 37L7203)[2]	9.1 GB (P/N 00N8207 or 37L7204)[2]	18.2 GB (P/N 00N8208 or 37L7205)[2]	36.4 GB (P/N 00N8209 or 37L7206)[2]
0 GB	Standard on Base Models			Standard on Base Models		
9.1GB	1	-	-	1	-	-
18.2GB	2	1	-	2	1	-
27.3GB	3	-	-	3	-	-
36.4GB	4[3]	2	1	4[3]	2	1
45.5GB	-	-	-	-	-	-
54.6GB	-	3	-	-	3	-
72.8GB	-	4[3]	2	-	4[3]	2
91GB	-	-	-	-	-	-
109.2GB	-	-	3	-	-	3
145.6GB (max)	-	-	4[3]	-	-	4[3]

This table does not represent all possible hard drive configurations.
1. Select a total storage row then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within ± 0.2 GB unless otherwise noted.
2. Both hot-swap and non-hot-swap HDDs are listed. Select the appropriate part number for the model of xSeries 220 being configured.
3. A maximum of three hot-swap drives may be installed in hot-swap models. This configuration requires installation of a non-hot-swap HDD in Bay 4.

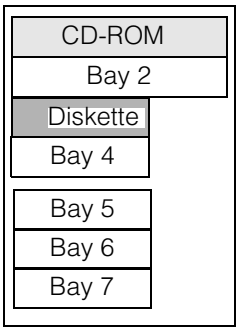
Part Number	Description	RPM	Height	Hot-Swap Models		Non-Hot-Swap Models	
				Bays Supported	Maximum Quantity	Bays Supported	Maximum Quantity
	Non-Hot-Swap Ultra160 Hard Disk Drives (HDD)[1]						
00N8204	9.1GB 7200 rpm Ultra160 SCSI HDD	7200	SL	4	1	4…7	4
00N8205	18.2GB 7200 rpm Ultra160 SCSI HDD	7200	SL	4	1	4…7	4
00N8206	36.4GB 7200 rpm Ultra160 SCSI HDD	7200	SL	4	1	4…7	4
00N8207	9.1GB 10,000 rpm Ultra160 SCSI HDD	10,000	SL	4	1	4…7	4
00N8208	18.2GB 10,000 rpm Ultra160 SCSI HDD	10,000	SL	4	1	4…7	4
00N8209	36.4GB 10,000 rpm Ultra160 SCSI HDD	10,000	SL	4	1	4…7	4
	Hot-Swap Ultra160 Hard Disk Drives (HDD)[2]						
37L7201	9.1GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	5…7	3	-	-
37L7202	18.2GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	5…7	3	-	-
37L7203	36.4GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	5…7	3	-	-
37L7204	9.1GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	5…7	3	-	-
37L7205	18.2GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	5…7	3	-	-
37L7206	36.4GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	5…7	3	-	-
	External Storage Expansion Units[3]	**Form Factor**					
35301RU	Netfinity EXP200 Storage Expansion Unit[4]	Rack (3U)					
37L5857	Netfinity EXP200 Rack-to-Tower Conversion Kit	-					
37L0075	Netfinity EXP200 350 W Redundant Power Supply	-					
35311RU	EXP300 Storage Expansion Unit[5]	Rack (3U)					

09N7296	EXP300 Rack-to-Tower Conversion Kit	-

1.Non-hot-swap HDDs are supported in bays 4…7 of non-hot swap models and in bay 4 of hot-swap models.
2.Hot-swap HDDs are supported in bays 5…7 of hot-swap models. Bay 4 supports non-hot-swap HDDs only.
3. Not supported by the onboard SCSI controller. Select an optional SCSI controller then refer to Appendix D: Cables-Storage Units-Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
4. Netfinity EXP200 includes a single 2 M Ultra2 SCSI cable and a single hot-swap 350W power supply and power cord. Optional hot-swap Netfinity EXP200 350W Redundant Power Supply (P/N 37L0075) includes an additional power cord. To convert an EXP200 to match the system's tower form factor, Netfinity EXP200 Rack-to-Tower Conversion Kit (P/N 37L5857) is required.
5. EXP300 includes a single 2M Ultra2 SCSI cable and dual hot-swap 500 W redundant power supplies, each with its own power cord. To convert an EXP300 to a tower form factor, EXP300 Rack-to-Tower Conversion Kit (P/N 09N7296) is required.

Bay	Form Factor	Height	Front Access	Usage
1	133 mm (5.25")	HH	yes	IDE CD-ROM
2	133 mm (5.25")	HH	yes	open[1]
3	89 mm (3.5")	SL	yes	Floppy
4	89mm (3.5")	SL	yes	open
5…7	89mm (3.5")	SL[2]	yes	open

1. This bay does not support hard drive options. It can be used for removable media devices such as tape drives.
2. These bays will be configured as hot-swap bays on models -2AX, -3AX, -4AX.



xSeries 220 Internal SCSI Cabling

Non-Hot-Swap Models

xSeries 220 non-hot-swap models are cabled internally with a five-drop, 16-bit wide LVD SCSI cable with a built-in multi-mode active terminator on one end of the cable. The other end of the cable is attached to the internal 68-pin connector of the integrated Ultra160 SCSI controller. SCSI devices can be connected to any of the five cable connectors. If 8-bit (narrow) devices are to be installed, a 68- to 50-pin converter (32G3925) is required for each narrow device.

Hot-Swap Models

xSeries 220 hot-swap models are cabled internally with a two-drop, 16-bit wide LVD SCSI cable. One end is connected to the internal 68-pin connector of the integrated Ultra160 SCSI controller. The first drop is designed to support a SCSI device in the 3.5-inch non-hot-swap bay, while the second drop is connected to the hot-swap SCSI backplane.The SCSI backplane provides termination for the SCSI bus.

Other Configuration Alternatives

In the case where a RAID controller is used to support internal drives in a xSeries 220, the standard cable is moved from the onboard controller to the RAID adapter. To connect a tape drive to the onboard or other supported SCSI controller, the two-drop cable from Media Bay Tray and LVD Cable Kit (P/N 10K2340) must be used.

External SCSI support can be obtained by installing an optional SCSI adapter or RAID controller and using appropriate external SCSI cabling.

xSeries 220 I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported[1]
	Storage Controllers[2]			
37L6091	ServeRAID-4L Ultra160 SCSI Controller[3]	Full	32-bit	1...5
37L6080	ServeRAID-4M Ultra160 SCSI Controller[4]	Full	32/64-bit	1...5
19K4646	PCI Wide Ultra160 SCSI Adapter[5]	Half	32-bit	1...5
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	1...5
	Networking[6]			
	Ethernet			
09N9901	10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1...5
34L0301	Netfinity Gigabit Ethernet SX Adapter	Half	32/64-bit	1...5
19K4401	Netfinity Gigabit Ethernet Adapter	Half	32/64-bit	1...5
34L4601	Netfinity 10/100 Ethernet Security Adapter	Half	32/64-bit	1...5
	Token Ring			
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN	Half	32-bit	1...5[7]
34L5001	16/4 Token-Ring PCI Management Adapter	Half	32-bit	1...5[7]
	Communications[8]			
33L4618	PCI V.90 56 Data/Fax Modem	Half	32-bit	1...5
37L14xx	Serial I/O SST 8, 16 and 128 Port Adapters	Half	32-bit	1...5

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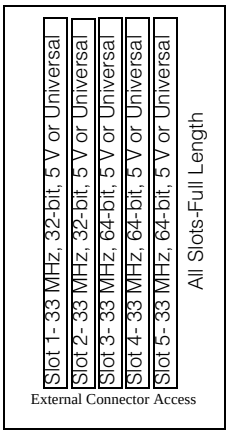

Slot 1- 33 MHz, 32-bit, 5 V or Universal
Slot 2- 33 MHz, 32-bit, 5 V or Universal
Slot 3- 33 MHz, 64-bit, 5 V or Universal
Slot 4- 33 MHz, 64-bit, 5 V or Universal
Slot 5- 33 MHz, 64-bit, 5 V or Universal
All Slots-Full Length
External Connector Access

1. The xSeries 220 has five full-length, 33 MHz PCI expansion slots, three 64-bit and two 32-bit.
2. xSeries 220 has an integrated Ultra160 SCSI Controller with a single internal channel and includes a five drop, multi-mode terminated LVD SCSI cable.
3. ServeRAID-4L Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8-mm VHDCI.
4. ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two external 0.8-mm VHDCI Ultra160 connectors.
5. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilized.
6. The xSeries 220 includes an integrated full-duplex, 10/100 Mbps Ethernet controller.
7. Wake on LAN function supported when installed in slot 1 only.
8. xSeries 220 includes two USB ports, two high-speed serial/asynchronous ports, (NS16550A software compatible) and one high-speed parallel port supporting devices using SSP/EPP/ECP protocols adhering to the IEEE 1284 Standard.

xSeries 220 Power, Monitor & Accessories

Part Number	Description
	Power[1]
	Free Standing Uninterruptible Power Supply (UPS)[2]
94G3134	APC Smart-UPS 700
94G3135	APC Smart-UPS 1000
94G3136	APC Smart-UPS 1400
	Rack Mount Uninterruptible Power Supply (UPS)[2]
94G6674	APC Smart-UPS 1400RMB[3]
94G6676	APC Smart-UPS 3000RMB[3]
37L6861	APC Smart-UPS 5000RMB[4]
	Monitors[5]
633347N	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
6331B2N	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
6332J1N	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[6]
66274AN	G78 Color Monitor 17" (406.4mm, 16.0" Viewable Image Size), stealth black[6]
9511AG1	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable Image Size), stealth black[7]
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit II

1. The xSeries 220 includes a 330 W voltage sensing power supply and a single line cord..
2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
3. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
4. Height is 5U. See "Rack and NetBAY" for supported IBM racks.
5. The xSeries 220 includes an integrated SVGA controller(S3 Savage4 Chipset) with 8Mb of video memory
6. Installation within a rack requires optional Monitor Compartment (P/N94G7444).
7. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit II (P/N 37L6888) and Netfinity Rack Keyboard Tray (P/N 28L4707). A space saver keyboard may coexist within the same 28L4707 keyboard tray.

Part Number	Description
	Conversion Kits
09N4300	4Ux20D Tower-to-Rack Kit
	Rack and NetBAY[1]
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack
9306910	Netfinity Rack (Perforated Doors)
36L9703	Netfinity Rack Extension Kit
9306200	Netfinity NetBAY22
36L9702	NetBAY22 Rack Extension Kit
	Keyboard and Mouse[2]
28L3644	Space Saver II Keyboard[3, 4]
01K1260	TrackPoint IV 104-key Black Keyboard[4, 5]
28L3621	Preferred Keyboard (stealth black)[5]
28L3673	Sleek 2-button Stealth Black Mouse

1 Rack installation of an xSeries 220 requires 4Ux20D Tower-to-Rack Kit (P/N 09N4300) and one of the racks listed here. See IBM Netfinity Rack Cabinet and Options section for IBM rack supported devices.
2. The xSeries 220 includes both a mouse and non-space saver keyboard.
3. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
4. Advanced TrackPoint IV features are not available on IBM Netfinity systems.
5. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.

xSeries 220 Tape Options

Part Number	Description	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures[1]
09N4041	12/24GB DDS/3 4-mm Internal SCSI Tape Drive[2, 3]	2	8	89 mm (3.5") HH or 133 mm (5.25") HH	Y	Y	3510020, 3551001
09N4042	10/20GB NS Internal SCSI Tape Drive[2, 3]	2, 4	8	89 mm (3.5") SL or 133 mm (5.25") HH	Y	Y	3510020, 3551001
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive[3]	2	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	Y	N/A	3510020, 3551001[4]
	External Tape Enclosures						
3510020	External Half High SCSI Storage Enclosure[5]	-	8/16	Desktop	N	N	-
3551001	NetMEDIA Storage Expansion Unit EL[6]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[7]	-	16 LVD	-	N	N	3551001
	Associated Options						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	External	Y	N	3510020
10K2340	Media Bay Tray and LVD Cable Kit[8]	-	16 LVD	Internal	Y	N	3551001

Note: All models include an Ultra160 SCSI controller with a five-drop multi-mode terminated LVD SCSI cable. Single-Ended devices attached to this cable will limit the entire SCSI bus to single- ended performance. All tape drives and external tape enclosures are supported by PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which includes a five-drop multi-mode terminated LVD SCSI cable and an external 0.8-mm VHDCI connector.

1. To determine cable requirements, note the tape drive's SCSI interface, the appropriate SCSI controller from the system configurator section, and the desired enclosure, then refer to Appendix D: Cables - Storage Units - Controllers.
2.This single-ended device will limit the SCSI bus to which it is attached to Ultra SCSI speeds. To provide a dedicated tape SCSI bus, install PCI Wide ultra160 SCSI Adapter (P/N 19K4646) which includes a five-drop multi-mode LVD SCSI cable.
3. RAID configurations, where the standard SCSI cable is attached to a RAID adapter, require the two-drop multi-mode terminated LVD SCSI cable included with Media Bay Tray and LVD Cable Kit (P/N 10K2340) for attachment of the tape drive to the standard SCSI controller.
4. LVD support for LVD devices installed in a NetMEDIA Storage Expansion Unit EL (P/N 3551001) requires replacement of the standard single-ended internal cables with one or more (depending on configuration) cables from Media Bay Tray and LVD Cable Kit (P/N 10K2340) which contains a single two-drop mult-mode terminated cable. If the standard cables are used for attachment to LVD devices, single-ended SCSI rules and bus speeds apply.
5. Provides a black desktop 133 mm (5.25") half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
6. NetMEDIA Storage Expansion Unit EL (P/N 3551001) is a black 3U, 19" rack or NetBAY3/3E mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included.
7. NetMEDIA Systems Management Adapter (P/N 10L7113) may be installed in a 3551001 to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the 3551001 is powered off. External connector is 0.8-mm VHDCI.
8. Media Bay Tray and LVD Cable Kit (P/N 10K2340) includes an internal two-drop multi-mode terminated LVD SCSI cable.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes

xSeries 220 Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

Internet Server

Part Number	Description	Quantity
8645-3AX	x220 866 Mhz/256KB, 128MB ECC, OPEN-HS, 48X, PCI	1
33L3142	128 MB 133Mhz SDRAM ECC RDIMM[1]	1
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD[2]	2
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive	2
6331B2N	E54 Color Monitor 15" (350 mm, 13.8" Viewable Image Size), stealth black	1
94G3134	APC Smart-UPS 700	1

1. For a total of 192 MB of system memory.
2. For a total of 35.4 GB of internal storage.

An Internet server is a server that handles all requests from the Internet (Intranet or Extranet). Usually, this type of server has the same characteristics as a normal file server. The main difference is that an internet server talks a different language (TCP/IP vs. NETBEUI or IPX/SPX) and often needs to do an extra security check (firewall). In the case of an Internet server, the server itself talks mostly to just one client, the Internet Service Provider (ISP), instead of many clients like a file server does.

With this is mind, the xSeries 200 was selected to provide an affordable price point for the growing Internet server market with two-way Pentium III processing, 256 MB of system memory (expandable to 4 GB), and power protection with an APC Smart-UPS.

The network configuration depends on the method that will be used to connect the server to the Internet. Usually fast Ethernet routers are used, but if other methods are used you can add the appropriate adapter. The configuration includes a tape backup unit for secure backup of critical data in the event of a system or storage failure.

File and Print Server

Part Number	Description	Quantity
8645-2AX	x220 800 Mhz/256KB, 128MB ECC, OPEN-HS, 48X, PCI	1
33L3142	128 MB 133Mhz SDRAM ECC RDIMM[1]	1
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD[2]	3
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive	1
6331B2N	E54 Color Monitor 15" (350 mm, 13.8" Viewable Image Size), stealth black	1
94G3134	APC Smart-UPS 700	1

1. For a total of 192 MB of system memory.
2. For a total of 35.4 GB of internal storage.

A small business or departmental server is usually required to perform all typical server functions while servicing up to 100 users in a normal workgroup computing environment, but doesn't require the high-end performance and fault-tolerance properties of larger servers.

The sample configuration above consists of an xSeries 220 with 256 MB of memory and 54.6 GB of hard disk space. It has enough processor power and memory to run most current network operating systems comfortably and enough hard disk drive space to store a significant amount of data with additional external storage expansion still available. Demanding network traffic is effectively handled by the standard 100 Mbps Ethernet connection.

This configuration also includes a tape backup unit, monitor, and a UPS to keep the system protected during power surges and outages.

Application Server

Part Number	Description	Quantity
8645-42X	x220 933 MHz/256KB, 128MB ECC, 18.2GB, 48X, PCI	1
10K3819	Netfinity 933 MHz with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Upgrade Processor	1
33L3144	256 MB 133 MHz SDRAM ECC RDIMM[1]	1
37L6091	ServeRAID-4L Ultra160 SCSI Controller	1
00N8205	18.2GB 7200 rpm Ultra160 SCSI HDD[2]	2
10K2340	Media Bay Tray and LVD Cable Kit[3]	1
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive NS Internal SCSI Tape Drive	1
6331B2N	E54 Color Monitor 15" (350 mm, 13.8" Viewable Image Size), stealth black	1
94G3134	APC Smart-UPS 700	1

1. For a total of 384 MB of system memory.
2. For a total of 54.6 GB of internal storage.
3. Cable for dedicated attachment of tape to standard controller.

An application server differs from a file and print server in that it has a higher workload, in providing application serving requirements for users. With this in mind, the xSeries 220 was selected to provide an affordable price point for an application server, with two-way Pentium III processing, 384 MB of system memory (expandable to 4 GB), and availability features such as RAID protected internal storage and power protection with an APC Smart-UPS.

IBM xSeries 230 and Netfinity 5100

Part Number	Processor Speed (MHz)[5]	Number of Processors (Std./Max)	L2 ECC Cache (KB)	Memory (Std./Max) (R = RDIMM)[2]	Form Factor	Power Supply Quantity (Std./Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)[3]	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std./Max)	CD-ROM (IDE)[4]	Bays: (Total/Avail)	Slots: (Total/Avail)
xSeries 230 / Netfinity 5100 At-A-Glance																
8658-11Y	667	1/2	256	128 MB(R)/4 GB	Tower	1/3	O - Power S - HDD	O - Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X- 17X	10/8	5/5
8658-1RY[1]	667	1/2	256	128 MB(R)/4 GB	Rack (5U)	1/3	O - Power S - HDD	O - Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X- 17X	10/8	5/5
8658-21Y	733	1/2	256	128 MB(R)/4 GB	Tower	1/3	O - Power S - HDD	O - Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X- 17X	10/8	5/5
8658-2RY[1]	733	1/2	256	128 MB(R)/4 GB	Rack (5U)	1/3	O - Power S - HDD	O - Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X- 17X	10/8	5/5
8658-31Y	800	1/2	256	128 MB(R)/4 GB	Tower	1/3	O - Power S - HDD	O - Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X- 17X	10/8	5/5
8658-3RY[1]	800	1/2	256	128 MB(R)/4 GB	Rack (5U)	1/3	O - Power S - HDD	O - Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X- 17X	10/8	5/5
8658-41Y	866	1/2	256	128 MB(R)/4 GB	Tower	1/3	O - Power S - HDD	O - Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X- 17X	10/8	5/5
8658-4RY[1]	866	1/2	256	128 MB(R)/4 GB	Rack (5U)	1/3	O - Power S - HDD	O - Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X- 17X	10/8	5/5
8658-51Y	933	1/2	256	128 MB(R)/4 GB	Tower	1/3	O - Power S - HDD	O - Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X- 17X	10/8	5/5
8658-5RY[1]	933	1/2	256	128 MB(R)/4 GB	Rack (5U)	1/3	O - Power S - HDD	O - Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X- 17X	10/8	5/5
8658-61Y[6]	1 GHz	1/2	256	128 MB(R)/4 GB	Tower	1/3	O - Power S - HDD	O - Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X- 17X	10/8	5/5
8658-6RY[1, 6]	1 GHz	1/2	256	128 MB(R)/4 GB	Rack(5U)	1/3	O - Power S - HDD	O - Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X- 17X	10/8	5/5

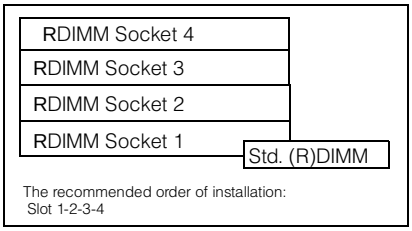
1. Housed in a 19" Rack mountable drawer and ships standard without a keyboard or mouse. See "Rack and NetBAY" under "Power, Monitor & Accessories" for supported IBM racks.
2. High-speed, 133 MHz SDRAM.
3. Up to two additional 250 W Hot-Swap Redundant Power Supplies (P/N 33L3760) and a single Hot-Swap Power Supply Expansion Kit (P/N 37L6881) are required for power supply redundancy. See Power, Monitor & Accessories for additional information.
4. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
5. Intel Pentium III processor with advanced transfer (full-speed) L2 cache and 133 MHz Front-Side Bus.
6. This model is an IBM xSeries 230.

xSeries 230 / Netfinity 5100 Processors

Part Number	Processor Upgrades with 256 KB Cache (Full Speed)	SMP Support[1]	Processor Speed Upgrade[2]
00N7949	Netfinity 667 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	1xY	-
00N7943	Netfinity 733 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	2xY	1xY
10K2338	Netfinity 800 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	3xY	All 1...2xY
19K4630	Netfinity 866 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	4xY	All 1...3xY
19K4631	Netfinity 933 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	5xY[3]	-
19K4640	1 GHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	6xY	5xY

1. One additional processor may be installed, providing a maximum of two. All processors must be identical in type, speed, and cache size.
2. Requires removal of the standard processor. A maximum of two processors may be installed. All processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".
3. Netfinity 933 MHz Upgrade Processor (P/N 19K4631) is only supported on 8658-5xY models due to thermal restrictions.

xSeries 230 / Netfinity 5100 Memory



The recommended order of installation:
Slot 1-2-3-4

Part Number	Memory Description[1]
33L3123	128 MB 133 MHz SDRAM ECC RDIMM II
33L3125	256 MB 133 MHz SDRAM ECC RDIMM II
33L3127	512 MB 133 MHz SDRAM ECC RDIMM II
33L3129	1 GB 133 MHz SDRAM ECC RDIMM II

1. The recommended order of installation is in sequence from Socket 1 to Socket 4. Memory size is not a factor.

Total Memory[1]	Quantity of RDIMMs Added			
128 MB (1 x 128) Models	128 MB (33L3123)	256 MB (33L3125)	512 MB (33L3127)	1 GB (33L3129)
256 MB	1	-	-	-
384 MB	2 or	1	-	-
512 MB	3	-	-	-
640 MB	-	2 or	1	-
896 MB	-	3	-	-
1024 MB	-	4[2]	-	-
1152 MB	-	-	2 or	1
1664 MB	-	-	3	-
2048 MB	-	-	4[2]	-
2176MB	-	-	-	2
3200 MB	-	-	-	3
4096 MB (max)	-	-	-	4[2]

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller RDIMMs may provide a more cost-effective alternative to using larger RDIMMs.
1. Network Operating Systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. Requires removal of standard memory.

xSeries 230 / Netfinity 5100 Hard Disk Drive (HDD) and External Storage

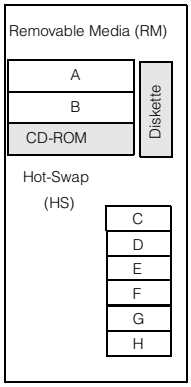
Total Int. Storage[1]	7200RPM Hard Disk Drives (HDDs)			10,000RPM Hard Disk Drives (HDDs)		
	9.1 GB (P/N 36L9744 or P/N 37L7201)	18.2 GB (P/N 36L9745 or P/N 37L7202)	36.4 GB (P/N 37L7203)	9.1 GB (P/N 36L9748 or P/N 37L7204)	18.2 GB (P/N 36L9749 or P/N 37L7205)	36.4 GB (P/N 37L7206)
0 GB	Standard on Base Models			Standard on Base Models		
9.1 GB	1	-	-	1	-	-
18.2 GB	2	1	-	2	1	-
27.3 GB	3	-	-	3	-	-
36.4 GB	4	2	1	4	2	1
45.5 GB	5	-	-	5	-	-
54.6 GB	6	3	-	6	3	-
72.8 GB	-	4	2	-	4	2
91 GB	-	5	-	-	5	-
109.2 GB	-	6	3	-	6	3
145.6 GB	-	-	4	-	-	4
182 GB	-	-	5	-	-	5
218.4 GB (max.)	-	-	6	-	-	6

This table does not represent all possible hard drive configurations.
1. Select a total storage row then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within +/- 0.2 GB unless otherwise noted.

Bay	Form Factor	Height	Front Access	Usage
A	133 mm (5.25")	HH[1]	Yes	Open
B	133 mm (5.25")	HH[1]	Yes	Open
-	133 mm (5.25")	SL	Yes	IDE CD-ROM
-	89 mm (3.5")	SL	Yes	Diskette
C…H	HS	SL[2]	Yes	Open

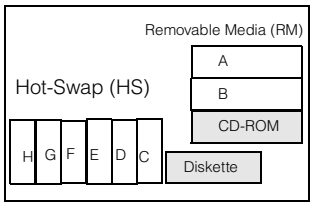
1. Two half-high (HH) bays can be combined to support a single full-high (FH) device. Installation of devices in Bays A or B may require Netfinity Hot-Swap Power Supply Expansion Kit (P/N 37L6881) and at least one Netfinity 250 W Hot-Swap Redundant Power Supply (P/N 33L3760). Installation of HDDs in Bays A and B also requires Media Bay Tray and LVD Cable Kit (P/N 10K2340).
2. Two slim-line (SL) bays (C/D, E/F, G/H) can be combined to support a single half-high (HH) device.

Tower Model View



For clarity purposes, bay labels in these diagrams are for reference by the accompanying tables and are not the actual labels. Refer to the documentation shipped with the system for further details on actual labels.

Rack Model View



Part Number	Description	RPM	Height	Bays Supported	Max. Qty.
Hot-Swap Ultra2 Hard Disk Drives (HDD)					
36L9744	Netfinity 9.1 GB Wide Ultra2 SCSI Hot-Swap SL HDD	7200	SL	C…H	6
36L9745	Netfinity 18.2 GB Wide Ultra2 SCSI Hot-Swap SL HDD	7200	SL	C…H	6
36L9748	Netfinity 9.1 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	10,000	SL	C…H	6
36L9749	Netfinity 18.2 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	10,000	SL	C…H	6
Hot-Swap Ultra160 Hard Disk Drives (HDD)					
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	C…H	6
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	C…H	6
37L7203	36.4 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	C…H	6
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	C…H	6
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	C…H	6
37L7206	36.4 GB 10-K Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	C…H	6
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15000	SL	C…H	6
19K0656	8.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15000	SL	C…H	6
Non-Hot-Swap Internal Hard Disk Drives (HDDs)					
20L0553	9.1 GB Wide Ultra2 SCSI HDD[1]	7200	SL	A, B[1]	2
20L0554	18.2 GB Wide Ultra2 SCSI HDD[1]	7200	SL	A, B[1]	2
Associated Options					
10K2340	Media Bay Tray and LVD Cable Kit[2]	-	-	A/B	1
33L3760	250 W Hot-Swap Redundant Power Supply	-	-	-	-
37L6881	Hot-Swap Power Supply Upgrade Kit[3]	-	-	-	-

External Storage Expansion Units[4]		Form Factor
35301RU	Netfinity EXP200 Storage Expansion Unit[5]	Rack (3U)
37L5857	Netfinity EXP200 Rack-to-Tower Conversion Kit	-
37L0075	Netfinity EXP200 350 W Redundant Power Supply	-
35311RU	EXP300 Storage Expansion Unit[6]	Rack (3U)
09N7296	EXP300 Rack-to-Tower Conversion Kit	-
35601RU	FAStT EXP500 Storage Expansion Unit[7]	Rack (3U)

1. Additional power may be required when installing a SCSI device in bay A or B. Configurations exceeding four SL hot-swap hard disk drives and two PCI adapters require both Hot-Swap Power Supply Upgrade Kit (P/N 37L6881) and at least one optional 250 W Hot-Swap Redundant Power Supply (P/N 33L3760). Example: 3 SL HS HDD's plus 5 adapters - no additional power supply required. An optional SCSI cable is required. A two-drop terminated LVD SCSI cable is included with both Media Bay Tray and LVD Cable Kit (P/N 10K2340) and Hot-Swap Power Supply Upgrade Kit (P/N 37L6881).
2. Media Bay Tray and LVD Cable Kit (P/N 10K2340) contains a two-drop terminated LVD SCSI cable and the hardware required to convert two half-high 5.25" removable media bays into two non-hot-swap 7200 RPM HDD bays.
3. Hot-Swap Power Supply Upgrade Kit (37L6881) contains a hot-swap power backplane that supports installation for up to three hot-swap power supplies.

4. Select an optional SCSI controller then refer to Appendix D: Cables-Storage Units-Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
5. Netfinity EXP200 includes a single 2 M Ultra2 SCSI cable and single hot-swap 350W power supply and power cord. Optional hot-swap Netfinity EXP200 350W Redundant Power Supply (P/N 37L0075) includes an additional power cord.
6. EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500W redundant power supplies, each with its own power cord.
7. FAStT EXP500 Storage Expansion Unit (P/N 35601RU) includes dual hot-swap 350W power supplies, each with its own power cord.

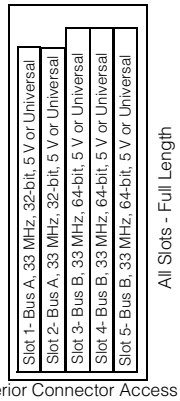
xSeries 230 / Netfinity 5100 Internal SCSI Cabling

The xSeries 230 and Netfinity 5100 contain a DASD backplane supporting six hot-swap, SCA-2 compliant drive bays. The backplane is connected to channel A of the integrated dual-channel, Ultra160 SCSI controller connector through a 16-bit LVD SCSI cable. If internal RAID support is required, this cable can be used to connect to a supported RAID adapter rather than the integrated SCSI controller. No external SCSI port is included.

A two-drop, 16-bit LVD SCSI cable with integrated terminator is also included with the Netfinity Hot-Swap Power Supply Expansion Kit (P/N 37L6881).This cable is included in the expansion kit because installation of SCSI devices in bays A and B requires additional power. The two-drop cable supports up to two internal devices in these bays. This cable can be attached to channel B of the integrated dual-channel Ultra160 SCSI controller or to a supported SCSI adapter.

xSeries 230 / Netfinity 5100 I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported
	Storage Controllers[1]			
19K0564	Netfinity ServeRAID-3L Ultra2 SCSI Adapter II[2]	Full	32-bit	1…5
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter[3]	Full	32/64-bit	1…5
37L6091	ServeRAID-4L Ultra160 SCSI Controller[4]	Full	32/64-bit	1…5
37L6080	ServeRAID-4M Ultra160 SCSI Controller[5]	Full	32/64-bit	1…5
37L6889	ServeRAID-4H Ultra160 SCSI Controller[6]	Full	32/64-bit	1…5
19K4646	PCI Wide Ultra160 SCSI Adapter[16]	Half	32/64-bit	1…5
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	1…5
	Fibre Storage Controllers and Options[7]			
35261RU	Netfinity Fibre Channel RAID Controller Unit	-	-	-
01K7296	Netfinity Fibre Channel Failsafe RAID Controller	-	-	-
00N6881	Netfinity FAStT Host Adapter	Half	32/64-bit	1…5
35521RU	FAStT500 Storage Server	-	-	-
35421RU	FAStT200 Storage Server	-	-	-
35422RU	FAStT200 HA Storage Server	-	-	-
19K1121	FAStT200 Redundant RAID Controller	-	-	-
2108R3S	SAN Data Gateway Router (Single-Ended)	-	-	-
2108R3D	SAN Data Gateway Router (Differential)	-	-	-
2109S08	SAN Fibre Channel Switch, 8-Port	-	-	-
2109S16	SAN Fibre Channel Switch, 16-Port	-	-	-
	Networking[8]			
	Ethernet			
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1…5
34L0301	Netfinity Gigabit Ethernet SX Adapter	Half	32/64-bit	1…5
	Token Ring			
34L0701	Token-Ring 16/4 PCIAdapter 2 with Wake on LAN[17]	Half	32-bit	1…5
	Communications[9]			
33L4618	PCI V.90 56 Data/Fax Modem[10]	Half	32-bit	1…5
	Systems Management[11]			
01K7209	Netfinity Advanced System Management PCI Adapter[12]	Full	32-bit	1…5[13]


Slot 1- Bus A, 33 MHz, 32-bit, 5 V or Universal
Slot 2- Bus A, 33 MHz, 32-bit, 5 V or Universal
Slot 3- Bus B, 33 MHz, 64-bit, 5 V or Universal
Slot 4- Bus B, 33 MHz, 64-bit, 5 V or Universal
Slot 5- Bus B, 33 MHz, 64-bit, 5 V or Universal
All Slots - Full Length
Exterior Connector Access

03K9309	Netfinity Advanced System Management Interconnect Cable Kit[14]	-	-	-
36L9654	Netfinity Advanced System Management Token-Ring Connection[15]	-	-	-
Host Attach				
9086001	Netfinity ESCON Adapter[18]	Full	32-bit	1...5[19]

1. xSeries 230 / Netfinity 5100 includes a dual-port, dual-channel Ultra160 SCSI controller for internal use only. No standard external port is available. See "Internal SCSI Cabling" for cabling alternatives.
2. Netfinity ServeRAID-3L Ultra2 SCSI Adapter II (P/N 19K0564) provides either one internal or one external (0.8-mm VHDCI) LVDS SCSI channel and is a planned replacement for P/N 01K7364.
3. Netfinity ServeRAID-3HB Ultra2 SCSI Adapter (P/N 37L6086) provides one internal and two external (0.8-mm VHDCI) LVDS SCSI channels. The internal channel can be configured for external usage (0.8-mm VHDCI) providing a total of three external LVDS SCSI channels. Includes 32 MB of mirrored battery-backup cache which helps protect against data loss in write-back cache mode in the event of a power outage or adapter maintenance.
4. ServeRAID-4L Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8-mm VHDCI.
5. ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two internal and two external Uoltra160 connectors (only two connectors may be utilized). External connectors are 0.8-mm VHDCI .
6. ServeRAID-4H Ultra160 SCSI Controller is powered by a 266 MHz PowerPC 750 processor and provides 128 MB of battery-backed ECC cache with two internal and up to four external Ultra160 connectors (only four connectors may be utilized). External connectors are 0.8-mm VHDCI.
7. See Netfinity Fibre Array Solutions section for additional configuration information.
8. xSeries 230 / Netfinity 5100 includes a full-duplex, 10/100 Mbps Ethernet PCI controller.
9. xSeries 230 / Netfinity 5100 includes two USB ports, two serial and one parallel port.
10. Due to homologation variances, modem availability may differ by country.
11. The Netfinity Advanced Systems Management Processor and Interconnect Bus integrated into xSeries 230 / Netfinity 4500R works with Netfinity Director to provide significant system management function. When used with optional Netfinity Advanced System Management PCI Adapter (P/n 01K7209) and Netfinity Advanced System Management Interconnect Cable Kit (P/N 03K9309) additional management and control of up to 12 service processors from a remote console through a single modem or LAN connection is possible.
12. Includes PCI adapter, Netfinity Advanced System Management Interconnect Cable Kit components and 56-watt AC adapter, which requires a separate power source. Provides an integrated 10/100 Ethernet port and a PCMCIA slot to support optional Netfinity Advanced System Management Token-Ring Connection (P/N 36L9654).
13. A maximum quantity of one is supported.
14. Required for all xSeries / Netfinity Servers containing a standard Advanced System Management Processor that are to be interconnected for system management support through a LAN or modem connection (Netfinity 5500 models 8660- 1...4xU are not supported). Optional Netfinity Advanced System Management PCI Adapter (P/N 01K7209) includes the contents of this option.Up to 12 service processors may be interconnected (including standard and optional processors) with an aggregate connection length of no more than 91.4 meters (300 ft.). A customer-supplied Ethernet cable is required for each interconnection.
15 Contains an IBM Turbo 16/4 Token-Ring PCI card, which installs in the PCMCIA card slot of Netfinity Advanced System Management PCI Adapter (P/N 01K7209), and a PC Card to 9-pin D-Shell cable which is routed to an available adapter slot opening (reduces available slots by one). The Netfinity Advanced System Management PCI Adapter's integrated Ethernet port and Netfinity Advanced System Management Token-Ring Connection cannot be connected or used together.
16. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilized.
17. The Wake on LAN function of this option is not supported by this server.
18. Provides an ESCON MIC and a DB9 Serial Port. Cables are not included but are available through S/390 channels. Contact your IBM representative for additional information.
19. A maximum of two 9086001 adapters (installed in non-adjacent slots) are supported in a single server.

xSeries 230 / Netfinity 5100 Power, Monitor & Accessories

Part Number	Description
	Power[1]
33L3760	250 W Hot-Swap Redundant Power Supply[2]
37L6881	Hot-Swap Power Supply Expansion Kit[3]
	Uninterruptible Power Supply (UPS)[4]
94G3135	APC Smart-UPS 1000
94G3136	APC Smart-UPS 1400
94G6674	APC Smart-UPS 1400RMB[5]
94G6676	APC Smart-UPS 3000RMB[5]
37L6861	APC Smart-UPS 5000RMB[6]
	Monitors[7]
633347N	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[8]
6331B2N	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[8]
6332J1N	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[8]
66274AN	G78 Color Monitor 17" (454-mm, 17.9" Viewable Image Size), stealth black[8]
9511AG1	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable), stealth black[9]

1. xSeries 230 / Netfinity 5100 include single 250 W, hot-swap power supply and a single 9 ft. 110 V power cord with an IEC 320-C13 connector on the system end and NEMA 5-15P on the other end. Power supply redundancy may be achieved with the addition of optional 250 W Hot-Swap Redundant Supply (P/N 33L3760). Hot-Swap Power Supply Upgrade Kit (P/N 37L6881) is required when optional power supplies are to be added. Redundancy for configurations of greater than 250 W requires installation of a second optional supply. Whenever devices are installed in bays A or B, both the expansion kit and a second power supply are required. Generally, configurations containing greater than six PCI adapters and HDDs, in any combination, will require the second power supply. To assist in determining when an additional power supply is required to preserve redundancy, a "Non-Redundant LED" is a standard feature.
2. 250 W Hot-Swap Redundant Power Supply (P/N 33L3760) includes a single 6 ft.power cord for connection to a low voltage wall outlet. Hot-Swap Power Supply Expansion Kit (P/N 37L6881) must be installed prior to adding optional power supplies.
3. Hot-Swap Power Supply Expansion Kit (P/N 37L6881) includes a hot-swap power backplane, terminated two-drop LVD SCSI cable, and mounting brackets for DLT tape drives. Required when installing a second power supply or devices in the 133-mm (5.25") HH bays.
4. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
5. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
6. Height is 5U. See "Rack and NetBAY" for supported IBM racks.
7. Netfinity 5100 uses an SVGA controller (S3 Savage4 chipset) with 8 MB of video memory.
8. Installation within a rack requires optional Monitor Compartment (P/N 94G7444).
9. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit II (P/N 37L6888) and Netfinity Rack Keyboard Tray (P/N 28L4707). A space saver keyboard may coexist within the same 28L4707 keyboard tray.

Part Number	Description
Conversion Kits	
37L6858	5Ux24D Tower-to-Rack Kit
Rack and NetBAY[1]	
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack
9306910	Netfinity Rack (includes perforated front door)
9306200	Netfinity NetBAY22
Keyboard and Mouse[2]	
28L3644	Space Saver II Keyboard[3, 5]
01K1260	TrackPoint IV 104-Key Black Keyboard[4, 5]
28L3621	Preferred Keyboard (stealth black)[4]
28L3673	Sleek 2-Button Stealth Black Mouse

1. xSeries 230 / Netfinity 5100 rack models are housed in a 19" rack mountable drawer and require one of the racks listed here. See IBM Netfinity Rack Cabinet and Options section for IBM rack supported devices.
2. Tower models include both a keyboard and mouse. Rack models include neither.
3. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
4. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.
5. Advanced TrackPoint IV features are not available on IBM Netfinity systems.

xSeries 230 / Netfinity 5100 Tape Options

Part Number	Tape Drives	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive[1]	A, B	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	Y	N/A	3510020, 3551001[2]
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive[1]	A, B	16	133 mm (5.25") HH	N	N/A	3510020[3], 3551001
09N4040	20/40 GB DLT Internal SCSI Tape Drive[1]	A/B	8	133 mm (5.25") FH	N	Y	3503B0X[3], 3551001
00N7990	40/80 GB DLT Internal SCSI Tape Drive[1]	A/B	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	3503B0X[3], 3551001[2]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive[1]	A, B	16 Ultra2 LVD	133 mm (5.25") HH	N	N/A	3510020[3], 3551001[2]
Tape Autoloaders							
3502108	DLT Tape Autoloader	N/A	16	Desktop	Y	-	-

00N7992	120/240GB DDS/4 Tape Autoloader[1]	A/B	16 Ultra2 LVD	133 mm (5.25") FH	N	N	3551001[2]
	External Tape Libraries[4]						
3502x14	DLT Tape Library	-	16	Desktop orRack	Y	-	-
	External Tape Enclosures						
3510020	External Half High SCSI Storage Enclosure[5]	-	8/16	Desktop	N	N	-
3503B0X	DLT External SCSI Enclosure[6]		16	Desktop	N	N	-
3551001	NetMEDIA Storage Expansion Unit EL[7]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[8]	-	16 LVD	-	N	N	3551001
	Associated Options						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	Ext.	Y	N	3510020, 3503B0X
10K2340	Media BayTray and LVD Cable Kit[9]	-	16 LVD	Int.	Y	N	3551001
37L6881	Netfinity Hot-Swap Power Supply Expansion Kit[10]	-	16 LVD	Int.	Y	N	-
33L3760	250 W Hot-Swap Redundant Power Supply	-	-	-	-	-	-

Note: Additional power may be required when installing a SCSI device in bay A or B. Configurations exceeding four SL hot-swap hard disk drives and two PCI adapters require both Hot-Swap Power Supply Expansion Kit (P/N 37L6881) and at least one optional 250 W Hot-Swap Redundant Power Supply (P/N 33L3760). Example: 3 SL HS HDD's plus 5 adapters - no additional power supply required. An optional SCSI cable is required for attachment of media bay devices to Ultra160 controller B. No external SCSI port is available. External tape enclosures are supported by PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which has an external 0.8-mm VHDCI connector.

1. Requires two-drop multi-mode terminated LVD SCSI cable included with either Media Bay Tray and LVD Cable Kit (P/N 10K2340) or Hot-Swap Power Supply Expansion Kit (P/N 37L6881).
2. LVD support for LVD devices requires installation of the 16-bit multi-mode terminated, two-drop, SCSI cable included with optional Media Bay Tray and LVD Cable Kit (P/N 10K2340).
3. Requires 68-pin External Multimode LVD/SE SCSI terminator (P/N 00N7956).
4. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
5. Provides a black desktop 133 mm (5.25") half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
6. Provides a black desktop DLT tape enclosure with a 68-pin high density external connector. Requires termination by the tape drive or by installation of an External Multimode LVD/SE SCSI terminator (P/N 00N7956).
7. NetMEDIA Storage Expansion Unit EL (P/N 3551001) is a black 3U, 19" rack or NetBAY3/3E mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included.
8. NetMEDIA Systems Management Adapter (P/N 10L7113) may be installed in a 3551001 to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the 3551001 is powered off. External connector is 0.8-mm VHDCI.
9. Media Bay Tray and LVD Cable Kit (P/N 10K2340) includes an internal two-drop multi-mode terminated LVD SCSI cable.
10. Hot-Swap Power Supply Expansion Kit (P/N 37L6881) includes a hot-swap power backplane, and two-drop multi-mode terminated LVD SCSI cable. Required when installing a second power supply.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.

xSeries 230 / Netfinity 5100 Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

Internet Server

Part Number	Description	Quantity
8658-51Y	xSeries 230 933 MHz/256 KB, 128 MB ECC, OPEN, 40X, PCI	1
33L3123	128 MB 133 MHz SDRAM ECC RDIMM II[1]	1
37L6091	ServeRAID-4L Ultra160 SCSI Controller	1
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD[2]	4
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive	1
6331B2N	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black	1
94G3135	APC Smart-UPS 1000	1
37L6881	Hot-Swap Power Supply Expansion Kit	1
33L3760	250 W Hot-Swap Redundant Power Supply	1

1. For a total of 256 MB of system memory.
2. For a total of 36.4 GB of RAID protected hot-swap, hot-spare internal storage.

An internet server is a server that handles all requests from the Internet (intranet or extranet). Usually this type of server has the same characteristics as a file server. The main difference is that an internet server talks a different language (TCP/IP vs. NETBEUI or IPX/SPX) and often needs to do an extra security check (Firewall). In the case of an internet server, the server itself talks mostly to just one client, the Internet Service Provider (ISP), instead of many clients like a file server does.

With this in mind the xSeries 230 was selected to provide an affordable price point for the growing internet server market, 256 MB of system memory (expandable to 4 GB, and availability features such as RAID protected internal hot-swap storage and power protection with an APC Smart-UPS.

The network configuration depends on the method that will be used to connect the server to the internet. Usually fast Ethernet routers are used, but if other methods are used, you can add the appropriate adapter. The configuration includes a tape backup unit for secure backup of critical data in the event of a system or storage failure.

File and Print Server

Part Number	Description	Quantity
8658-61Y	xSeries 230 1 GHz/256 KB, 128 MB ECC, OPEN, 40X, PCI	1
33L3123	128 MB 133 MHz SDRAM ECC RDIMM II[1]	1
37L6091	ServeRAID-4L Ultra160 SCSI Controller	1
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD[2]	5
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive	1
6331B2N	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black	1
94G3135	APC Smart-UPS 1000	1
37L6881	Hot-Swap Power Supply Expansion Kit	1
33L3760	250 W Hot-Swap Redundant Power Supply	1

1. For a total of 256 MB of system memory.
2. For a total of 45.5 GB of RAID protected hot-swap, hot-spare internal storage.

A small business or departmental server is usually required to perform all typical server functions while servicing up to 100 users in a normal workgroup computing environment, but doesn't require the high end performance and fault tolerance properties of larger servers.

The sample configuration above consists of an xSeries 230 with 256 MB of memory (expandable to 4 GB) and 45.5 GB of hard disk space. It has enough processor power and memory to run most current network operating systems comfortably and enough hard disk drive space to store a significant amount of data with additional external storage expansion still available. Demanding network traffic is effectively handled by the standard 100 Mbps Ethernet connection.

The configuration also includes a tape backup unit, monitor, and a UPS to keep the system protected during power surges and outages.

Rack Mounted Application Server

Part Number	Description	Quantity
8658-5RY	xSeries 230 933 MHz/256 KB, 128 MB ECC, OPEN, 40X, PCI (Rack 5U)	1
19K4631	933 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	1
33L3125	256 MB 133 MHz SDRAM ECC RDIMM II[1]	1
37L6080	ServeRAID-4M Ultra160 SCSI Controller	1
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD[2]	5
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive	1
6331B2N	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black	1
94G6674	APC Smart-UPS 1400RMB	1
33L3760	250 W Hot-Swap Redundant Power Supply	1
37L6881	Hot-Swap Power Supply Expansion Kit	1
	Industry Standard 19" Rack, EIA-310D, min. depth of 28" (711 mm)	
9306200	Netfinity NetBAY22	1
28L3644	Space Saver II Keyboard	1
28L3645	Blank Filler Kit	2

1. For a total of 384 MB of system memory.
2. For a total of 36.4 GB of usable RAID 5 storage (45.5 GB total disk).

An application server differs from a file and print server in that it has a higher workload, in providing application serving requirements for users. With this in mind, the xSeries 230 was selected to provide an affordable price point for an application server, with two-way Pentium III processing, 384 MB of system memory (expandable to 4 GB), and availability features such as battery-backed cache, RAID protected internal hot-swap storage and power protection with an APC Smart-UPS.

High-Availability 5100 Cluster (P/N 19K8604)[1]

Part Number	Description[2]	Quantity
8658-11Y	Netfinity 5100 Pentium III 667 MHz/256 KB L2, 128 MB ECC, OPEN, 40X, PCI	2
37L7201	Netfinity 9.1 GB Ultra160 SCSI Hot-Swap SL HDD	2
19K0564	Netfinity ServeRAID-3L Ultra2 SCSI Adapter II	2
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	2
	Storage Subsystem	
35301RU	Netfinity EXP200 Storage Expansion Unit	1
37L5857	Netfinity EXP200 Rack-to-Tower Conversion Kit	1
36L9748	Netfinity 9.1 GB 10K-3 Eide Ultra2 SCSI Hot-Swap SL HDD	5
03K9310	Netfinity 2M Ultra2 SCSI Cable	1
37L0075	Netfinity EXP200 350 W Redundant Power Supply	1
	Cluster Interconnect	
76H0551	Ethernet Cluster Interconnect Cable[3]	1
	Support Devices[4]	
65464AN	G54 Color Monitor 15" (348-mm, 13.7" Viewable Image Size), stealth black	1
28L0542	Netfinity Console Server Selector Switch (4-port)	1
94G7447	NetBAY Console Cable Set- 12 ft. (3.66 m)	2
	Cluster Options	
00N7949	Netfinity 667 MHz 133 FSB/256KB Upgrade with Pentium III Processor	2
01K7262	Netfinity 128 MB SDRAM ECC RDIMM	2

36L9748	Netfinity 9.1 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	5
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter	1
01K7209	Netfinity Advanced System Management PCI Adapter	1
03K9309	Netfinity Advanced System Management Interconnect Cable Kit	1
33L4618	PCI V.90 56 Data/Fax Modem	2
00N7990	40/80GB DLT Internal SCSI Tape Drive	1
94G3136	APC Smart-UPS 1400	1

1. The High-Availability 5100 Cluster is a complete tower solution comprised of IBM Netfinity 5100 Servers (P/N 8658-11Y). This solution includes the choice of Microsoft Windows NT Enterprise Edition or Microsoft Windows 2000 Advanced Server (each includes Microsoft Cluster Services (MCS) functions). Additional options are supported to provide flexibility to handle more robust applications.
2. Hardware configurations are subject to change as new products are tested that will enhance the solution. To view the most current Netfinity High-Availability 5100 Cluster configurations, visit our web site at: http://www.pc.ibm.com/us/netfinity/5100cluster.html.
3. This part cannot be ordered separately from the Netfinity High-Availability 5100 Cluster solution.
4. These options are available for your purchase as part of the Netfinity High-Availability 5100 Cluster.

IBM xSeries 240 and Netfinity 5600

Part Number	Processor Speed (MHz)[2]	Number of Processors (Std./Max)	L2 ECC Cache (KB)	Memory (Std./Max) (R = RDIMM)	Form Factor	Power Supply Quantity (Std./Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std./Max)	CD-ROM (IDE)	Bays: (Total/Avail)	Slots: (Total/Avail)
xSeries 240 / Netfinity 5600 At-A-Glance																
8664-21Y	600EB	1/2	256	256 MB(R)/4 GB[3]	Tower	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218 GB	40X- 17X[5]	10/8	5/5
8664-2RY[1]	600EB	1/2	256	256 MB(R)/4 GB[3]	Rack(5U)	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218 GB	40X- 17X[5]	10/8	5/5
8664-31Y	667	1/2	256	256 MB(R)/4 GB[3]	Tower	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218 GB	40X- 17X[5]	10/8	5/5
8664-3R[1]Y	667	1/2	256	256 MB(R)/4 GB[3]	Rack (5U)	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218 GB	40X- 17X[5]	10/8	5/5
8664-41Y	733	1/2	256	256 MB(R)/4 GB[3]	Tower	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218 GB	40X- 17X[5]	10/8	5/5
8664-4RY[1]	733	1/2	256	256 MB(R)/4 GB[3]	Rack (5U)	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218 GB	40X- 17X[5]	10/8	5/5
8664-51Y	800	1/2	256	256 MB(R)/4 GB[3]	Tower	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218 GB	40X- 17X[5]	10/8	5/5
8664-5RY[1]	800	1/2	256	256 MB(R)/4 GB[3]	Rack (5U)	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218 GB	40X- 17X[5]	10/8	5/5
8664-61Y	866	1/2	256	256 MB(R)/4 GB[3]	Tower	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218 GB	40X- 17X[5]	10/8	5/5
8664-6RY[1]	866	1/2	256	256 MB(R)/4 GB[3]	Rack (5U)	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218 GB	40X- 17X[5]	10/8	5/5
8664-71Y	933	1/2	256	256 MB(R)/4 GB[3]	Tower	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218 GB	40X- 17X[5]	10/8	5/5
8664-7RY[1]	933	1/2	256	256 MB(R)/4 GB[3]	Rack (5U)	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218 GB	40X- 17X[5]	10/8	5/5
8664-81Y[6]	1 GHz	1/2	256	256 MB(R)/4 GB[3]	Tower	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218 GB	40X- 17X[5]	10/8	5/5
8664-8RY[1, 6]	1 GHz	1/2	256	256 MB(R)/4 GB[3]	Rack(5U)	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218 GB	40X- 17X[5]	10/8	5/5

1. Housed in a 19" Rack mountable drawer and ships standard without a keyboard or mouse. See "Rack and NetBAY" under "Power, Monitor & Accessories" for supported IBM racks.
2. Intel Pentium III processor with advanced transfer (full speed) L2 cache and 133 Mhz Front-Side Bus.
3. High-speed, 133 MHz SDRAM.
4. Robust configurations may require optional 250W Hot-Swap Redundant Power Supply (P/N 33L3760) for redundancy. See "Power" under "Netfinity 5600 Power, Monitor & Accessories" for additional information.
5. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
6. This model is an IBM xSeries 240.

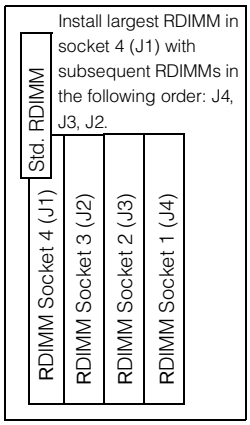
xSeries 240 / Netfinity 5600 Processors

Part Number	Processor Upgrades with 256 KB Cache (Full Speed)	SMP Support[1]	Processor Speed Upgrade[2]
10K2168	Netfinity 533EB MHz 133 FSB/256 KB Upgrade with Pentium III Processor	1xY	-
00N7948	Netfinity 600EB MHz 133 FSB/256 KB Upgrade with Pentium III Processor	2xY	All 1xY
00N7949	Netfinity 667 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	3xY	All 1…2xY
00N7943	Netfinity 733 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	4xY	All 1…3xY

10K2338	Netfinity 800 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	5xY	All 1…4xY
19K4630	Netfinity 866 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	6xY	All 1…5xY
19K4631	Netfinity 933 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	7xY	All 1…6xY
19K4640	1 GHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	8xY	-

1. One additional processor may be installed, providing a maximum of two. All processors must be identical in type, speed, and cache size.
2. Requires removal of the standard processor. A maximum of two processors may be installed. All processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".

xSeries 240 / Netfinity 5600 Memory


Install largest RDIMM in socket 4 (J1) with subsequent RDIMMs in the following order: J4, J3, J2.
Std. RDIMM
RDIMM Socket 4 (J1)
RDIMM Socket 3 (J2)
RDIMM Socket 2 (J3)
RDIMM Socket 1 (J4)

Total Memory[1]	Quantity of RDIMMs Added			
256 MB (1 x 256) Models	128 MB (33L3058)	256 MB (33L3060)	512 MB (33L3062)	1 GB (33L3064)
384 MB	1	-	-	-
512 MB	2 or	1	-	-
640 MB	3	-	-	-
768 MB	-	2 or	1	-
1024 MB	-	3	-	-
1280 MB	-	-	2 or	2
1792MB	-	-	3	-
2048MB	-	-	4[2]	-
2304MB	-	-	-	2
3328 MB	-	-	-	3
4096 MB (max)	-	-	-	4[2]

This table does not represent all possible memory configurations.
1. Network Operating Systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. Requires removal of standard memory.

Part Number	Memory Description[1]
33L3058	128 MB, 133 MHz SDRAM ECC RDIMM
33L3060	256 MB, 133 MHz SDRAM ECC RDIMM
33L3062	512 MB, 133 MHz SDRAM ECC RDIMM
33L3064	1 GB, 133 MHz SDRAM ECC RDIMM

1. Install largest RDIMM in socket 4 (J1) with subsequent RDIMMs in the following order: J4, J3, J2.

xSeries 240 / Netfinity 5600 Hard Disk Drive (HDD) and External Storage

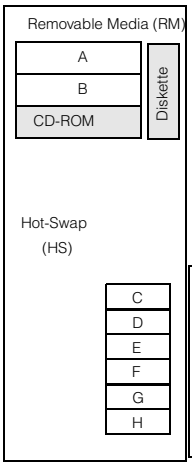
Total Int. Storage[1]	7200RPM Hard Disk Drives (HDDs)			10,000RPM Hard Disk Drives (HDDs)		
	9.1 GB (P/N 36L9744 or P/N 37L7201)[2]	18.2 GB (P/N 36L9745 or P/N 37L7202)[2]	36.4 GB (P/N 36L9746 or 37L7203)[2]	9.1 GB (P/N 36L9748 or P/N 37L7204)[2]	18.2 GB (P/N 36L9749 or P/N 37L7205)[2]	36.4 GB (P/N 36L9750 or 37L7206)[2]
0 GB	Standard on Base Models			Standard on Base Models		
9.1 GB	1	-	-	1	-	-
18.2 GB	2	1	-	2	1	-
27.3 GB	3	-	-	3	-	-
36.4 GB	4	2	1	4	2	1
45.5 GB	5	-	-	5	-	-
54.6 GB	6	3	-	6	3	-
72.8 GB	-	4	2	-	4	2
91 GB	-	5	-	-	5	-
109.2 GB	-	6	3	-	6	3
145.6 GB	-	-	4[3]	-	-	4[3]
182 GB	-	-	5[3]	-	-	5[3]
218.4 GB (max.)	-	-	6[3]	-	-	6[3]

This table does not represent all possible hard drive configurations.
1. Select a total storage row then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within +/- 0.2 GB unless otherwise noted.
2.Netfinity 5600 contains an Ultra2 hot-swap backplane which limits Ultra160 HDDs to Ultra2 bus speeds.
3.Part numbers 36L9746 and 36L9750 are half-high devices and therefore cannot be utilized for configurations requiring greater than a quantity of three.

Bay	Form Factor	Height	Front Access	Usage
A	133 mm (5.25")	HH[1]	Yes	Open
B	133 mm (5.25")	HH[1]	Yes	Open
-	133 mm (5.25")	HH	Yes	IDE CD-ROM
-	89 mm (3.5")	SL	Yes	Diskette
C…H	HS	SL[2]	Yes	Open

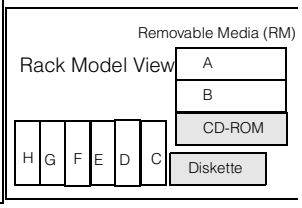
1. Two half-high (HH) bays can be combined to support a single full-high (FH) device
2. Two slim-line (SL) bays can be combined to support a single half-high (HH) device.

Tower Model View



For clarity purposes, bay labels in these diagrams are for reference by the accompanying tables and are not the actual labels. Refer to the documentation shipped with the system for further details on actual labels.

Rack Model View



P / N	Description	RPM	Height	Bays Supported	Max. Qty.
	Ultra2 Hard Disk Drives (HDD)				
36L9744	Netfinity 9.1 GB Wide Ultra2 SCSI Hot-Swap SL HDD	7200	SL	C…H	6
36L9745	Netfinity 18.2 GB Wide Ultra2 SCSI Hot-Swap SL HDD	7200	SL	C…H	6
36L9746	Netfinity 36.4 GB Wide Ultra2 SCSI Hot-Swap HDD	7200	HH[2]	C/D, E/F, G/H	3
36L9748	Netfinity 9.1 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	10,000	SL	C…H	6
36L9749	Netfinity 18.2 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	10,000	SL	C…H	6
36L9750	Netfinity 36.4 GB 10K-3 Wide Ultra2 SCSI Hot-Swap HDD	10,000	HH[2]	C/D, E/F, G/H	3
	Ultra160 Hard Disk Drives (HDD)[1]				
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	C…H	6
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	C…H	6
37L7203	36.4 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	C…H	6
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	C…H	6
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	C…H	6
37L7206	36.4 GB 10-K Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	C…H	6
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	C…H	6
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	C…H	6
	Non-Hot-Swap Internal Hard Disk Drives (HDD)				
20L0553	9.1 GB Wide Ultra2 SCSI HDD[3]	7200	SL	A, B[3]	2
20L0554	18.2 GB Wide Ultra2 SCSI HDD[3]	7200	SL	A, B[3]	2
	Associated Options				
10K2340	Media Bay Tray and LVD Cable Kit	-	-	A/B	1

	Ext Storage Expansion Units[4]	**Form Factor**
35301RU	Netfinity EXP200 Storage Expansion Unit[5]	Rack (3U)
37L5857	Netfinity EXP200 Rack-to-Tower Conversion Kit	Tower
37L0075	Netfinity EXP200 350 W Redundant Power Supply	-
35311RU	EXP300 Storage Expansion Unit[6]	Rack (3U)
09N7296	EXP300 Rack-to-Tower Conversion Kit	-
35601RU	FAStT EXP500 Storage Expansion Unit[7]	Rack (3U)

1. Netfinity 5600 contains an Ultra2 hot-swap backplane which limits Ultra160 HDDs to Ultra2 bus speeds.
2. Two slim-line (SL) bays can be combined to support a single half-high (HH) device.
3. Requires Media Bay Tray and LVD Cable Kit P/N 10K2340. Media Bay Tray and LVD Cable Kit converts two half-high 5.25" removable media bays into two non-hot-swap HDD bays.
4. Not supported by the onboard external SCSI port. Select an optional SCSI controller then refer to see Appendix D: Cables-Storage Units-Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
5. Netfinity EXP200 includes a single 2 M Ultra2 SCSI cable and a single hot-swap 350W power supply and power cord. Optional hot-swap Netfinity EXP 350 W Redundant Power Supply (P/N 37L0075) includes an additional power cord. To convert and EXP200 to a tower form factor, Netfinity EXP200 Rack-to-Tower Conversion Kit (P/N 37L5857) is required.
6. EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500 W redundant power supplies, each with its own power cord. To convert an EXP300 to a tower form factor, Netfinity EXP300 Rack-to-Tower Conversion Kit (P/N 09N7296) is required.
7. FAStT EXP500 Storage Expansion Unit (P/N 35601RU) includes dual hot-swap 350 W power supplies, each with its own power cord.

xSeries 240 / Netfinity 5600 Internal SCSI Cabling

The xSeries 240 and Netfinity 5600 contain a backplane supporting six hot-swap drive bays. The backplane is connected to the integrated dual channel, wide Ultra2 SCSI controller connector through a 16-bit LVD SCSI cable. If internal RAID support is required, this cable can be used to connect to a supported RAID adapter rather than the integrated SCSI controller. A two-drop, 16-bit SCSI cable with integrated terminator is also included with the server to support up to two internal removable media devices. This cable can be attached to the integrated SCSI controller if a RAID adapter is used to support the internal hot-swap drive bays. It can also be used to attach to a supported SCSI adapter if the integrated Ultra2 SCSI controller is utilized for the hot-swap bays. The second channel is available through an industry-standard 0.8-mm very high density connector interface (VHDCI) located on the rear panel for external use.

xSeries 240 / Netfinity 5600 I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported	Hot-Plug[2]
	Storage Controllers[1]				
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter[3]	Full	32/64-bit	1…5	X
37L6091	ServeRAID-4L Ultra160 SCSI Controller[4]	Full	32/64-bit	1…5	X
37L6080	ServeRAID-4M Ultra160 SCSI Controller[5]	Full	32/64-bit	1…5	X
37L6889	ServeRAID-4H Ultra160 SCSI Controller[6]	Full	32/64-bit	1…5	X
19K4646	PCI Wide Ultra160 SCSI Adapter[7]	Half	32/64-bit	1…5	-
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	1…5	-
	Fibre Storage Controllers and Options[8]				
35261RU	Netfinity Fibre Channel RAID Controller Unit	-	-	-	-
01K7296	Netfinity Fibre Channel Failsafe RAID Controller	-	-	-	-
00N6881	Netfinity FAStT Host Adapter	Half	32/64-bit	1…5	X
35521RU	FAStT500 Storage Server	-	-	-	-
35421RU	FAStT200 Storage Server	-	-	-	-
35422RU	FAStT200 HA Storage Server	-	-	-	-
19K1121	FAStT200 Redundant RAID Controller	-	-	-	-
35341RU	SAN Fibre Channel Managed Hub	-	-	-	-
2108R3S	SAN Data Gateway Router (Single-Ended)	-	-	-	-
2108RD	SAN Data Gateway Router (Differential)	-	-	-	-
2109S08	SAN Fibre Channel Switch, 8-Port	-	-	-	-
2109S16	SAN Fibre Channel Switch, 16-Port	-	-	-	-
	Networking[9]				
	Ethernet				
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1…5	X
09N9901	10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1…5	X
34L0301	Netfinity Gigabit Ethernet SX Adapter	Half	32/64-bit	1…5	X
	Token Ring				
34L5001	16/4 Token-Ring PCI Management Adapter[20]	Half	32-bit	1…5	X
34L5201	High-Speed 100/16/4 Token-Ring PCI Management Adapter	Half	32-bit	1…5	X
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN[20]	Half	32-bit	1…5	X
	Communications[10]				
33L4618	PCI V.90 56K Data/Fax Modem[11]	Half	32-bit	1…5	-
37L14xx	Serial I/O SST 8, 16 and 128 Port Adapters[12]	Half	32-bit	1…5[12]	-
	Systems Management[13]				
01K7209	Netfinity Advanced System Management PCI Adapter[14]	Full	32-bit	1…5[15]	-
03K9309	Netfinity Advanced System Management Interconnect Cable Kit[16]	-	-	-	-
36L9654	Netfinity Advanced System Management Token-RIng Connection[17]	-	-	-	-
	Host Attach				
9086001	Netfinity ESCON Adapter[18]	Full	32-bit	1…5[19]	-

Rack Model

Slot 5- PCI, Hot-Plug, 32/64-bit, Full Length	Slot 4- PCI, Hot-Plug, 32/64-bit, Full Length	Slot 3- PCI, Hot-Plug, 32/64-bit, Full Length	Slot 2- PCI, 32-bit, Full Length	Slot 1- PCI, 32-bit, Full Length

1. xSeries 240 / Netfinity 5600 has two integrated Wide Ultra2 SCSI channels. One is internal and the other is external with a 0.8-mm Very High Density Connection Interface (VHDCI).
2. Three of the five PCI slots are 32/64-bit hot-plug capable using IBM's Active PCI technology. For Network Operating System support access URL www.ibm.com/pc/us/compat.
3. Netfinity ServeRAID-3HB Ultra2 SCSI Adapter (P/N 37L6086) provides one internal and 2 external (0.8-mm VHDCI) LVDS SCSI channels. The internal channel can be configured for external usage (0.8-mm VHDCI connector) providing a total of 3 external LVDS SCSI channels. Includes 32MB of mirrored battery-backup cache which helps protect against data loss in write-back cache mode in the event of a power outage or adapter maintenance.
4. ServeRAID-4L Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and either one internal or one external Ultra160 connection. External connectors are 0.8-mm VHDCI.

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5. ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two internal and two external Ultra160 connectors (only two connectors may be utilized). External connectors are 0.8-mm VHDCI.
6.ServeRAID-4H Ultra160 SCSI Controller is powered by a 266 MHz PowerPC 750 processor and provides 128 MB of battery-backed ECC cache with two internal and up to four external Ultra160 connectors (only four connectors may be utilized). External connectors are 0.8-mm VHDCI.
7. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilized.
8. See Netfinity Fibre Array Solutions section for additional configuration information.
9. xSeries 240 / Netfinity 5600 has an integrated 10/100 PCI Ethernet Controller.
10. xSeries 240 / Netfinity 5600 includes two USB ports, three high-speed serial/asynchronous ports, (two NS16550A compatible, one for the Advanced System Management Processor), and one high-speed (up to 2 MB/sec. data transfer speed) bi-directional parallel port supporting devices using ECP/EPP/SSP protocols adhering to the IEEE 1284 standard.
11. Due to homologation variances, modem availability may differ by country.
12. See Appendix E for details on Serial I/O options and configuration limitations. A maximum of four Serial I/O adapters (any combination of P/N 37L1414, 37L1415, 37L1416, 37L1423) may be installed.
13. The Netfinity Advanced Systems Management Processor and Interconnect Bus integrated into xSeries 240 / Netfinity 5600 works with Netfinity Director to provide significant system management function. When used with optional Netfinity Advanced System Management PCI Adapter (P/N 01K7209) and Netfinity Advanced System Management Interconnect Cable Kit (P/N 03K9309) additional management and control of up to 12 service processors from a remote console through a single modem or LAN connection is possible.
14. Includes PCI adapter, Netfinity Advanced System Management Interconnect Cable Kit components and 56-watt AC adapter which requires a separate power source. Provides an integrated 10/100 Ethernet port and PCMCIA slot to support optional Netfinity Advanced System Management Token-Ring Connection (P/N 36L9654).
15. A maximum quantity of one is supported.
16. Required for all xSeries and Netfinity servers containing a standard Advanced System Management Processor that are to be interconnected for system management support through a LAN or modem connection (Netfinity 5500 models 8660- 1…4xU are not supported). Optional Netfinity Advanced System Management PCI Adapter (P/N 01K7209) includes the content of this option.
Up to 12 service processors may be interconnected (including standard and optional processors) with an aggregate connection length of no more than 91.4 meters (300 ft.). A customer-supplied Ethernet cable is required for each interconnection.
17. Contains an IBM Turbo 16/4 Token-Ring PCI Card, which installs in the PCMCIA card slot of Netfinity Advanced System Management PCI Adapter (P/N 01K7209), and a PC Card to 9-pin D-Shell cable which is routed to a rear chassis cut-out. The Netfinity Advanced System Management PCI Adapter integrated Ethernet port and Netfinity Advanced System Management Token-Ring Connection cannot be connected or used together.
18. Provides an ESCON MIC and DB9 Serial Port. Cables are not included but are available through S/390 channels. Contact your IBM representative for additional information.
19. A maximum of two 9086001 adapters (installed in non-adjacent slots) are supported in a single server.
20. The Wake on LAN function of this option is not supported by this server.

xSeries 240 / Netfinity 5600 Power, Monitor & Accessories

Part Number	Description
	Power[1]
33L3760	250 W Hot-Swap Redundant Power Supply
	Uninterruptible Power Supply (UPS)[2]
94G3135	APC Smart-UPS 1000
94G3136	APC Smart-UPS 1400
94G6674	APC Smart-UPS 1400RMB[3]
94G6676	APC Smart-UPS 3000RMB[3]
37L6861	APC Smart-UPS 5000RMB[4]
	Monitors[5]
633347N	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
6331B2N	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
6332J1N	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[6]
66274AN	G78 Color Monitor 17" (454-mm, 17.9" Viewable Image Size), stealth black[6]
9511AG1	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable), stealth black[7]

1. xSeries 240 / Netfinity 5600 include two 250W hot-swap power supplies, each with its own power cord. These standard power supplies are sufficient to operate fully configured systems; however optional 250W Hot-Swap Redundant Power Supply (P/N 33L3760) is required to preserve redundancy if any of the following are exceeded:

Single Processor Configuration

- Six SL hard disk drive (HDDs) and two PCI adapters
  (1 HH HDD = 2 SL, 1 tape = 2 SL, 1 PCI adapter = 2 SL)
  e.g. To preserve power supply redundancy with 3 PCI adapters only 4 SL HDDs can be installed before an optional power supply is required.

Dual Processor Configuration

-Four SL hard disk drives (HDDs) and two PCI adapters
(1 HH HDD = 2 SL, 1 tape = 2 SL, 1 PCI adapter = 2 SL)

A "non-redundant" LED on the system unit will indicate when 250W has been exceeded. 250 W Hot-Swap Redundant Power Supply (P/N 33L3760) includes a power cord which requires an additional power source. An independent power source such as a second UPS or second circuit is not required.
2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
3. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
4. Height is 5U. See "Rack and NetBAY" for supported IBM racks.
5. xSeries 240 / Netfinity 5600 use an SVGA controller (S3 Trio 3D chipset) with 4 MB of video memory.
6. Installation within a rack requires optional Monitor Compartment (P/N 94G7444).
7. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit II (P/N 37L6888) and Netfinity Rack Keyboard Tray (P/N 28L4707). A space saver keyboard may coexist within the same 28L4707 keyboard tray.

Part Number	Description
Conversion Kits	
37L6858	5Ux24D Tower-to-Rack Kit
Rack and NetBAY[1]	
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack
9306910	Netfinity Rack (includes perforated front door)
9306200	Netfinity NetBAY22
Keyboard and Mouse[2]	
28L3644	Space Saver II Keyboard[3, 5]
01K1260	TrackPoint IV 104-Key Black Keyboard[4,5]
28L3621	Preferred Keyboard (stealth black)[4]
28L3673	Sleek 2-Button Stealth Black Mouse

1. xSeries 240 / Netfinity 5600 rack models are housed in a 19" rack mountable drawer and require one of the racks listed here. See IBM Netfinity Rack Cabinet and Options section for IBM rack supported devices.
2. Tower models include both a mouse and a keyboard. Rack models include neither.
3. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
4. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.
5. Advanced TrackPoint IV features are not available on IBM Netfinity systems.

xSeries 240 / Netfinity 5600 Tape Options

Part Number	Tape Drives	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures
09N4042	10/20 GB NS Internal SCSI Tape Drive[1]	A, B	8	89 mm (3.5") SL or 133 mm (5.25") HH	Y	Y	3510020
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive[2]	A, B	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	Y	N/A	3510020, 3551001[3]
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive[1]	A, B	16	133 mm (5.25") HH	N	N/A	3510020[4], 3551001
09N4040	20/40 GB DLT Internal SCSI Tape Drive[1]	A/B	8	133 mm (5.25") FH	N	Y	3503B0X[4], 3551001
00N7990	40/80 GB DLT Internal SCSI Tape Drive[2]	A/B	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	3503B0X[4], 3551001[3]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive[2]	A, B	16 Ultra2 LVD	133 mm (5.25") HH	N	N/A	3510020[4], 3551001[3]

	Tape Autoloaders						
3502108	DLT Tape Autoloader	N/A	16	Desktop	Y	-	-
00N7992	120/240GB DDS/4 Tape Autoloader[2]	A/B	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	3551001[3]
	External Tape Libraries[5]						
3502x14	DLT Tape Library	-	16	Desktop orRack	Y	-	-
	External Tape Enclosures						
3510020	External Half High SCSI Storage Enclosure[6]	-	8/16	Desktop	N	N	-
3503B0X	DLT External SCSI Enclosure[7]		16	Desktop	N	N	-
3551001	NetMEDIA Storage Expansion Unit EL[8]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[9]	-	16 LVD	-	N	N	3551001
	Associated Options						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	Ext.	Y	N	3510020, 3503B0X
10K2340	Media BayTray and LVD Cable Kit[10]	-	16 LVD	Int.	Y	N	3551001

Note: Netfinity 5600 includes a wide two-drop single-ended terminated cable which can be used for attachment of internal tape drives to the onboard Ultra2 controller when the hot-swap backplane is attached to a RAID controller. If LVD support is required, an optional LVD cable must be ordered. An external Ultra2 SCSI port is available with a 0.8-mm VHDCI connector. External tape enclosures are supported by the standard external SCSI port or PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which has an external 0.8-mm VHDCI connector.
1. Non-RAID Configurations: Requires PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which contains a five-drop multi-mode terminated LVD SCSI cable.
2. RAID configurations: Configurations where the hot-swap backplane is cabled to a RAID controller, require the two-drop multi-mode terminated LVD SCSI cable included with Media Bay Tray and LVD Cable Kit (P/N 10K2340) for support of LVD devices in LVD mode. Use of the included single-ended terminated cable with an LVD device will be limited to single-ended SCSI rules.
3. LVD support for LVD devices requires installation of the 16-bit multi-mode terminated, two-drop, SCSI cable included with optional Media Bay Tray and LVD Cable Kit (P/N 10K2340).
4. Requires 68-pin External Multimode LVD/SE SCSI terminator (P/N 00N7956).
5. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
6. Provides a black desktop 133 mm (5.25") half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
7. Provides a black desktop DLT tape enclosure with a 68-pin high density external connector. Requires termination by the tape drive or by installation of an External Multimode LVD/SE SCSI terminator (P/N 00N7956).
8. NetMEDIA Storage Expansion Unit EL (P/N 3551001) is a black 3U, 19" rack or NetBAY3/3E mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included.
9. NetMEDIA Systems Management Adapter (P/N 10L7113) may be installed in a 3551001 to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the 3551001 is powered off. External connector is 0.8-mm VHDCI.
10. Media Bay Tray and LVD Cable Kit (P/N 10K2340) includes an internal two-drop multi-mode terminated LVD SCSI cable.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.

For a complete list of all IBM and non-IBM option compatibility with Network Operating Systems and IBM Netfinity Servers, access the ServerProven™ compatibility pages on the Web at URL www.ibm.com/pc/us/compat.

xSeries 240 / Netfinity 5600 Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

High Availability Application Server

Part Number	Description	Quantity	Usage
8664-71Y	xSeries 240 933 MHz/256 KB, 256 MB ECC, Open, 40X, PCI	1	-
33L3060	256 MB, 133 MHz SDRAM ECC RDIMM	1	512 MB total system memory
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD	2	9.1 mirrored for NOS
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	4	36 GB RAID 5 with hot-spare
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive	1	-
37L6091	ServeRAID-4L Ultra160 SCSI Controller	1	RAID 1 for OS, RAID 5 for data
33L3760	250 W Hot-Swap Redundant Power Supply	1	Full power redundancy
65464AN	G54 Color Monitor 15" (348 mm, 13.7" Viewable Image Size), stealth black	1	
94G3135	APC Smart-UPS 1000	1	UPS

This tower server is configured to act as the foundation for business critical applications, applications your business cannot afford to be without. Configured with enough disk drives to mirror the operating system and provide a standard RAID 5 environment for data, optional hot-swap redundant power and UPS for power even during a blackout, this server represents the leading edge in high availability. An internal tape drive is included to back up that all important asset…data. A modem could be included to allow out-of-band (non-LAN) system management utilizing the integrated Netfinity Advanced System Management Processor.

High Availability File Server

Part Number	Description	Quantity	Usage
8664-81Y	xSeries 240 1 GHz/256KB, 256 MB ECC, Open, 40X, PCI	1	-
37L7204	9.1 GB 10K-4 Ultra2 SCSI Hot-Swap SL HDD	6	45 GB available disk and one hot spare
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive	1	
37L6889	ServeRAID-4H Ultra160 SCSI Controller	1	RAID 5 array, with hot-spare
33L3760	250 W Hot-Swap Redundant Power Supply	1	Full power redundancy
65464AN	G54 Color Monitor 15" (348 mm, 13.7" Viewable Image Size), stealth black	1	-
94G3135	APC Smart-UPS 1000	1	-

This tower model is configured to meet the need of server consolidation. Many businesses are trying to get their arms around the dispersed departmental servers

that have grown up around the enterprise. By moving multiple servers onto one platform there is only one system to manage, both hardware and software. There is potentially less expensive for service, software licenses, etc., and there is no need to worry about putting all your eggs in one basket because the xSeries240 is designed for high availability. This configuration includes 56 GB of internal HDD storage, features a third power supply which provides fully redundant power, a UPS to help protect the system against a momentary electricity loss, and an internal tape drive that backs up, up to 40 GB per tape…in addition to all the standard features of the xSeries 240.

IBM xSeries 330

Part Number	Processor Speed (MHz)[2]	Number of Processors (Std./Max)	L2 ECC Cache (KB)	Memory (Std./Max) (R = RDIMM)	Form Factor	Power Supply Quantity (Std./Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std./Max)	CD-ROM (IDE)[3]	Bays: (Total/Avail)	Slots: (Total/Avail)
xSeries 330 At-A-Glance																
8654-11Y[1]	800	1/2	256	256 MB(R)/4 GB	Rack(1U)	1/1	H	-	Y	10/100	U160	-	0/72.8GB	24X- 10X	4/2	2/2
8654-31Y[1]	866	1/2	256	256 MB(R)/4 GB	Rack(1U)	1/1	H	-	Y	10/100	U160	-	0/72.8GB	24X- 10X	4/2	2/2
8654-41Y[1]	933	1/2	256	256 MB(R)/4 GB	Rack(1U)	1/1	H	-	Y	10/100	U160	-	0/72.8GB	24X- 10X	4/2	2/2
8654-51Y[1]	1 GHz	1/2	256	256 MB(R)/4 GB	Rack(1U)	1/1	H	-	Y	10/100	U160	-	0/72.8GB	24X- 10X	4/2	2/2

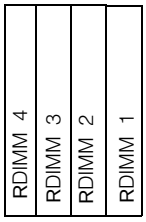
1. Housed in a 19" Rack mountable drawer and ships standard without a keyboard or mouse. See "Rack and NetBAY" under "xSeries 330 Power, Monitor & Accessories" for supported IBM racks.
2. Intel Pentium III processor with advanced transfer (full speed) L2 cache and 133 MHz Front-Side Bus (FSB).
3. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.

xSeries 330 Processors

Part Number	Processor Upgrades with 256 KB Cache (Full Speed)	SMP Support[1]	Processor Speed Upgrade[2]
10K3810	800 MHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	11Y	-
10K3806	866 MHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	31Y	1xY
10K0052	933 MHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	41Y	1…3xY
10K0053	1 GHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	51Y	1…4xY

1. One additional processor may be installed, providing a maximum of two. All processors must be identical in type, speed, and cache size.
2. Requires removal of the standard processor. A maximum of two processors may be installed. All processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".

xSeries 330 Memory



Part Number	Memory Description[1]
33L3142	128 MB, 133 MHz SDRAM ECC RDIMM II
33L3144	256 MB, 133 MHz SDRAM ECC RDIMM II
33L3146	512 MB, 133 MHz SDRAM ECC RDIMM II
33L3152	1 GB, 133 MHz SDRAM ECC RDIMM II

1. Memory RDIMMs must be installed in sequence from RDIMM connector 1 through connector 4. RDIMM size is not relevent.

Total Memory[1]	Quantity of RDIMMs Added			
256 MB (1 x 256) Models	128 MB (33L3123)	256 MB (33L3125)	512 MB (33L3127)	1 GB (33L3129)
384MB	1	-	-	-
512 MB	2 or	1	-	-
640 MB	3	-	-	-
768 MB	-	2 or	1	-
1024 MB	-	3	-	-
1280 MB	-	-	2 or	1
1792 MB	-	-	3	-
2048 MB	-	-	4[2]	-
2304 MB	-	-	-	2
3328 MB	-	-	-	3
4096 MB (max)	-	-	-	4[2]

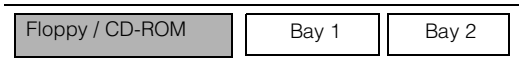
This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller RDIMMs may provide a more cost-effective alternative to using larger RDIMMs.
1. Network Operating Systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. Requires removal of standard memory.

xSeries 330 Hard Disk Drive (HDD) and External Storage

Total Int. Storage[1]	7200RPM Hard Disk Drives (HDDs)			10,000RPM Hard Disk Drives (HDDs)		
	9.1 GB (P/N 36L9744 or P/N 37L7201)	18.2 GB (P/N 36L9745 or P/N 37L7202)	36.4 GB (P/N 37L7203)	9.1 GB (P/N 36L9748 or P/N 37L7204)	18.2 GB (P/N 36L9749 or P/N 37L7205)	36.4 GB (P/N 37L7206)
0 GB	Standard on Base Models			Standard on Base Models		
9.1 GB	1	-	-	1	-	-
18.2 GB	2 or	1	-	2 or	1	-
36.4 GB	-	2 or	1	-	2 or	1
72.8 GB	-	-	2	-	-	2

This table does not represent all possible hard drive configurations.

1. Select a total storage row then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within +/- 0.2 GB unless otherwise noted.



Bay	Form Factor	Height	Front Access	Usage
1[1]	89 mm (3.5")	HS	Yes	Open
2	89 mm (3.5")	HS	Yes	Open

Part Number	Description	RPM	Height	Bays Supported	Max. Qty.
	Ultra2 Hard Disk Drives (HDD)				
36L9744	Netfinity 9.1 GB Wide Ultra2 SCSI Hot-Swap SL HDD	7200	SL	1…2	2

1. Boot drive should be located in bay 1.

36L9745	Netfinity 18.2 GB Wide Ultra2 SCSI Hot-Swap SL HDD	7200	SL	1...2	2
36L9748	Netfinity 9.1 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	10,000	SL	1...2	2
36L9749	Netfinity 18.2 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	10,000	SL	1...2	2
	Ultra160 Hard Disk Drives (HDD)				
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1...2	2
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1...2	2
37L7203	36.4 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1...2	2
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1...2	2
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1...2	2
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1...2	2

	External Storage Expansion Units[1]	**Form Factor**
35301RU	Netfinity EXP200 Storage Expansion Unit[2]	Rack (3U)
37L0075	Netfinity EXP200 350 W Redundant Power Supply	-
35311RU	Netfinity EXP300 Storage Expansion Unit[3]	Rack (3U)
35601RU	Netfinity FAStT EXP500 Storage Expansion Unit[4]	Rack (3U)

1. xSeries 330 does not include an external SCSI connector. Select an optional SCSI controller and then refer to Appendix D: Cables-Storage Units-Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
2. Netfinity EXP200 includes a single 2 M Ultra2 SCSI cable and a single hot-swap 350W power supply and power cord. Optional hot-swap Netfinity EXP200 350W Redundant Power Supply (P/N 37L0075) includes an additional power cord.
3. EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500W redundant power supplies, each with its own power cord.
4. FAStT EXP500 Storage Expansion Unit (P/N 35601RU) includes dual hot-swap 350W power supplies, each with its own power cord.

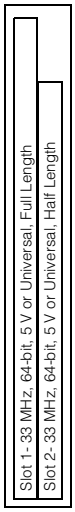
xSeries 330 Internal SCSI Cabling

xSeries 330 contains a DASD backplane supporting two hot-swap, SCA-2 compliant drive bays. The backplane is connected to one of the internal connectors of the integrated Ultra160 SCSI controller through a 16-bit LVD SCSI cable. If internal RAID is required, the cable can be attached to the internal connector of the optional RAID adapter. The cable is of sufficient length to attach to adapters in slot 1 but not slot 2.

In configurations where external SCSI device attachment is required, a supported SCSI adapter or ServeRAID controller must be installed.

xSeries 330 I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported
	Storage Controllers[1]			
37L6091	ServeRAID-4L Ultra160 SCSI Controller[2]	Full	32/64-bit	1
37L6080	ServeRAID-4M Ultra160 SCSI Controller[3]	Full	32/64-bit	1
37L6889	ServeRAID-4H Ultra160 SCSI Controller[4]	Full	32/64-bit	1
19K4646	PCI Wide Ultra160 SCSI Adapter[5]	Half	32/64-bit	1, 2
02K3454	PCI Fast/Wide Ultra SCSI Adapter[6]	Half	32-bit	1, 2
	Fibre Storage Controllers and Options[7]			
00N6881	Netfinity FAStT Host Adapter	Half	32/64-bit	1, 2
35521RU	FAStT500 Storage Server	-	-	-
00N6883	Netfinity FAStT500 256 MB Cache	-	-	-
35421RU	FAStT200 Storage Server	-	-	-
35422RU	FAStT200 HA Storage Server	-	-	-
19K1121	FAStT200 Redundant RAID Controller	-	-	-
35341RU	SAN Fibre Channel Managed Hub	-	-	-
2109S08	SAN Fibre Channel Switch, 8-Port	-	-	-
2109S16	SAN Fibre Channel Switch, 16-Port	-	-	-
35341RU	SAN Fibre Channel Managed Hub	-	-	-
	Networking[8]			
	Ethernet			
34L0301	Netfinity Gigabit Ethernet SX Adapter	Half	32/64-bit	1, 2
19K4401	Netfinity Gigabit Ethernet Adapter	Half	32/64-bit	1, 2
09N9901	10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1, 2
34L4601	Netfinity 10/100 Ethernet Security Adapter	Half	32/64-bit	1, 2
	Token Ring			
34L0701	Token-Ring 16/4 PCI Adapter2 with Wake on LAN[9]	Half	32-bit	1, 2
34L5001	16/4 Token-Ring PCI Management Adapter[9]	Half	32-bit	1, 2
34L5201	High-Speed 100/16/4 Token-Ring PCI Management Adapter	Half	32-bit	1, 2
	Communications[10]			
33L4618	PCI V.90 56 Data/Fax Modem	Half	32-bit	1, 2
37L14xx	Serial I/O SST 8, 16 and 128 port adapters	Half	32-bit	1, 2
	Systems Management[11]			
01K7209	Netfinity Advanced System Management PCI Adapter	Full	32-bit	1
03K9309	Netfinity Advanced System Management Interconnect Cable Kit	-	-	-
36L9654	Netfinity Advanced System Management Token-Ring Connection	-	-	-



Exterior Connector Access

1. xSeries 330 has an integrated single channel Ultra160 SCSI Controller.
2. ServeRAID-4L Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8-mm VHDCI.
3. ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two external 0.8-mm VHDCI Ultra160 connectors.
4. ServeRAID-4H Ultra160 SCSI Controller is powered by a 266 MHz Power PC 750 processor and provides 128 MB of battery-backed ECC cache with two internal and up to four external Ultra160 connectors (only four connectors may be utilized). External connectors are 0.8-mm VHDCI.
5. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector and one external 0.8-mm VHDCI Ultra160 connector. Support for external SCSI devices only. A five-drop terminated LVD SCSI cable is included but not supported for use in this server.
6. For use in supporting external SCSI devices such as tape drives.
7. See the Fibre Array Solutions section for additional configuration information.
8. xSeries 330 includes dual full-duplex, 10/100 Mbps Ethernet controllers.
9. The Wake on LAN function of this option is not supported by this server.
10. xSeries 330 includes two USB ports and a high speed serial/asynchronous port (NS16550A compatible).
11. xSeries 330 has a single integrated system management port and a single RS485 port.

xSeries 330 Power, Monitor & Accessories

Part Number	Description
	Power[1]
	Uninterruptible Power Supply (UPS)[2]
94G6674	APC Smart-UPS 1400RMB[3]
94G6676	APC Smart-UPS 3000RMB[3]
37L6861	APC Smart-UPS 5000RMB[4]
	Monitors[5]
06P4792	Cable Chain Technology Cable Kit
633347N	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
6331B2N	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
6332J1N	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[6]
66274AN	G78 Color Monitor 17" (406.4mm, 16.0" Viewable Image Size), stealth black[6]
9511AG1	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable Image Size), stealth black[7]
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit II

1. The xSeries 330 includes a worldwide, voltage sensing 200 W power supply and two 9' line cords.. One line cord contains a 110V NEMA 5-15P connector while the other contains an IEC 320 C14 for attachment to a high voltage PDU or UPS.
2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
3. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
4. Height is 5U. See "Rack and NetBAY" for supported IBM racks.
5. The xSeries 330 uses an SVGA controller (S-3 Savage4 chipset) with 8Mb of video memory. A Cable Chain Technology Cable Kit (P/N 06P4792) is required for the attachment of console devices to one or multiple chained xSeries 330s. The kit contains a 2M (6.5 feet) KVM breakout cable for attachment to a keyboard. mouse and monitor, as well as a 2 M (6.5 feet) KVM chaining cable for connecting two xSeries 330s together when the standard 245 mm (9.6 inches) KVM chaining cable is not long enough, A maximum of 42 xSeries 330s are supported in a single chain. No more than one kit may be used.
6. Installation within a rack requires optional Monitor Compartment (P/N94G7444).
7. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit II (P/N 37L6888) and Netfinity Rack Keyboard Tray (P/N 28L4707). A space saver keyboard may coexist within the same 28L4707 keyboard tray.

Part Number	Description
	Rack and NetBAY[1]
930842P	Netfinity Enterprise Rack[4]
930842X	Netfinity Enterprise Expansion Cabinet[4]
9306900	Netfinity Rack[2, 5]
06P6010	Netfinity Rack Front Door Kit[3]
9306910	Netfinity Rack (includes perforated front door)[5]
36L9703	Netfinity Rack Extension Kit
9306200	Netfinity NetBAY22[4, 5]
36L9702	NetBAY22 Rack Extension Kit
36L9701	Netfinity NetBAY3E[4, 6]
	Keyboard and Mouse[7]
06P4792	Cable Chain Technology Cable Kit
28L4707	Netfinity Rack Keyboard Tray
28L3644	Space Saver II Keyboard[8]
28L3621	Preferred Keyboard (stealth black)[9]
28L3673	Sleek 2-button Stealth Black Mouse

1. xSeries 330 is housed in a 19" rack mountable drawer and requires one of the racks listed here. See IBM Netfinity Rack Cabinet and Options section for IBM rack supported devices. To provide adequate cooling, Blank Filler Panel Kit (P/N 94G6670) should be placed on the front of any unused rack space. If non-IBM racks are to be used, assure that both the front and rear doors offer a minimum of 48% open area uniformely distributed and in line with installed servers. A clearance of 51 to 64-mm (2 to 2-1/2 inches) must be maintained between the front door and the system unit's front bezel. The rear door must maintain the same or greater clearance. Clearance between the EIA mounting rails and rack side covers must be less than 13-mm (1/2 -inch) to prevent air re-circulation from back to front. Non-rack or NetBAY3E installations are not supported.
2. To enable proper cooling, optional Netfinity Rack Front Door Kit (P/N 06P6010) must be installed or the front door must be removed.
3. Provides a perforated front door replacement for the standard glass door of a Netfinity Rack (P/N 9306900).
4. to enable proper cooling, the front door (bezel for NetBAY3E) must be removed.
5. Although not required, the use of an appropriate Extension Kit is recommended
6. Up to three xSeries 330s are supported for installation in a NetBAY3E and up to three NetBAY3Es are supported while installed beneath a Netfinity 8500R. An 8500R must be installed on top of the NetBAY3E.
7. A Cable Chain Technology Cable Kit (P/N 06P4792) is required for the attachment of console devices to one or multiple chained xSeries 330s. The kit contains a 2M (6.5 feet) KVM breakout cable for attachment to a keyboard. mouse and monitor, as well as a 2 M (6.5 feet) KVM chaining cable for connecting two xSeries 330s together when the standard 245 mm (9.6 inches) KVM chaining cable is not long enough, A maximum of 42 xSeries 330s are supported in a single chain. No more than one kit may be used.
8. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
9. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.

xSeries 330 Tape Options

Part Number	Description	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures
09N4041	12/24 GB DDS/4 4-mm Internal SCSI Tape Drive	N/A[1]	8	89 mm (3.5") HH or 133 mm (5.25") HH	Y	Y	3551001
09N4042	10/20GB NS Internal SCSI Tape Drive	N/A[1]	8	89 mm (3.5") SL or 133 mm (5.25") HH	Y	Y	3551001
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive	N/A[1]	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	Y	N/A	3551001[2]
09N4040	20/40 GB DLT Internal SCSI Tape Drive	N/A[1]	8	133 mm (5.25") FH	N	Y	3551001
00N7990	40/80 GB DLT Internal SCSI Tape Drive	N/A[1]	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	3551001[2]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive	N/A[1]	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	3551001[2]
	Tape Autoloaders						
00N7992	120/240GB DDS/4 Tape Autoloader	N/A[1]	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	3551001[2]
	External Tape Libraries[3]						
3502R14	DLT Tape Library	-	16	Rack	Y	N/A	-
	External Tape Enclosures						
3551001	NetMEDIA Storage Expansion Unit EL[4]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[5]	-	16 LVD	-	N	N	3551001
	Associated Options						
10K2340	Media Bay Tray and LVD Cable Kit[6]	-	16 LVD	Int.	Y	N	3551001

1. xSeries 330 does not support internal tape drives and does not include an external SCSI connector. An external tape or internal tape with a tape enclosure, supported SCSI adapter and appropriate cable must be selected. All tape drives and enclosures are supported by PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which has an external 0.8-mm VHDCI connector. Select tape drive, enclosure and supported adapter then use Appendix D: Cables-Storage Units-Controllers to select an appropriate external cable.
2.LVD support for LVD devices installed in a NetMEDIA Storage Expansion Unit EL (P/N 3551001) requires replacement of the standard single-ended internal cables with one or more (depending on configuration) cables from Media Bay Tray and LVD Cable Kit (P/N 10K2340) which contains a single two-drop mult-mode terminated cable. If the standard cables are used for attachment to LVD devices, single-ended SCSI rules and bus speeds apply.

3. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
4. NetMEDIA Storage Expansion Unit EL (P/N 3551001) is a black 3U, 19" rack or NetBAY3/3E mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included.
5. NetMEDIA Systems Management Adapter (P/N 10L7113) may be installed in a 3551001 to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the 3551001 is powered off. External connector is 0.8-mm VHDCI.
6. Media Bay Tray and LVD Cable Kit (P/N 10K2340) includes an internal two-drop multi-mode terminated LVD SCSI cable.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.

xSeries 330 Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

Internet Server[1]

Part Number	Description	Quantity
8645-41Y	xSeries 330 (Pentium III 933/256 MB/0 GB)	1
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD[2]	2
06P4792	Cable Chain Technology Cable Kit[3]	1
6331B2N	E54 Color Monitor 15" (350 mm, 13.8" Viewable Image Size), stealth black	1
28L3644	Space Saver II Keyboard	1
94G6674	APC Smart-UPS 1400RMB	1

1. This example shows a 19" rackable configuration. The rack components are not included.
2. For a total of 36.4 GB of internal storage.
3. A single Cable Chain Technology Cable Kit (P/N 06P4792) is required for attachment of one or multiple (up to 42) chained xSeries 330s to a single monitor, mouse and keyboard.

An Internet server is a server that handles all requests from the Internet (Intranet or Extranet). Usually, this type of server has the same characteristics as a normal file server. The main difference is that an internet server talks a different language (TCP/IP vs. NETBEUI or IPX/SPX) and often needs to do an extra security check (firewall). In the case of an Internet server, the server itself talks mostly to just one client, the Internet Service Provider (ISP), instead of many clients like a file server does.

With this is mind, the xSeries 330 was selected to provide an affordable price point for the growing Internet server market with two-way Pentium III processing, 256 MB of system memory (expandable to 4GB), and power protection with an APC Smart-UPS.

The network configuration depends on the method that will be used to connect the server to the Internet. Usually fast Ethernet routers are used, but if other methods are used you can add the appropriate adapter.

File and Print Server[1]

Part Number	Description	Quantity
8645-51Y	xSeries 330 (Pentium III 1 GHz/256 MB/0 GB)	1
33L3142	xSeries 128 MB 133 MHz ECC SDRAM RDIMM[2]	1
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD[3]	2
06P4792	Cable Chain Technology Cable Kit[4]	1
6331B2N	E54 Color Monitor 15" (350 mm, 13.8" Viewable Image Size), stealth black	1
28L3644	Space Saver II Keyboard	1
94G6674	APC Smart-UPS 1400RMB	1

1. This example shows a 19" rackable configuration. The rack components are not included.
2. For a total of 384 MB of system memory.
2. For a total of 72.8 GB of internal storage.
4. A single Cable Chain Technology Cable Kit (P/N 06P4792) is required for attachment of one or multiple (up to 42) chained xSeries 330s to a single monitor, mouse and keyboard.

A small business or departmental server is usually required to perform all typical server functions while servicing up to 100 users in a normal workgroup computing environment, but doesn't require the high-end performance and fault-tolerance properties of larger servers.

The sample configuration above consists of an xSeries 330 with 384MB of memory and 72.8 GB of hard disk space. It has enough processor power and memory to run most current network operating systems comfortably and enough hard disk drive space to store a significant amount of data with additional external storage expansion still available. Demanding network traffic is effectively handled by the standard 100 Mbps Ethernet connection.

This configuration also includes a UPS to keep the system protected during power surges and outages.

Application Server[1]

Part Number	Description	Quantity
8645-31Y	xSeries 330 (Pentium III 800/256 MB/0 GB)	1
10K3810	800 MHz Upgrade with 133MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	1
33L3144	xSeries 256 MB 133 MHz ECC SDRAM RDIMM[2]	1
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD[3]	2
06P4792	Cable Chain Technology Cable Kit[4]	1
6331B2N	E54 Color Monitor 15" (350 mm, 13.8" Viewable Image Size), stealth black	1
28L3644	Space Saver II Keyboard	1
94G6674	APC Smart-UPS 1400RMB	1

1. This example shows a 19" rackable configuration. The rack components are not included.
2. For a total of 512 MB of system memory.
2. For a total of 36.4 GB of internal storage.
4. A single Cable Chain Technology Cable Kit (P/N 06P4792) is required for attachment of one or multiple (up to 42) chained xSeries 330s to a single monitor, mouse and keyboard.

An application server differs from a file and print server in that it has a higher workload, in providing application serving requirements for users. With this in mind, the xSeries 330 was selected to provide an affordable price point for an application server, with two-way Pentium III processing, 512 MB of system memory (expandable to 4 GB), and availability features such as RAID-protected internal storage and power protection with an APC Smart-UPS.

IBM xSeries 340 and Netfinity 4500R

Part Number	Processor Speed (MHz)[2]	Number of Processors (Std./Max)	L2 ECC Cache (KB)	Memory (Std./Max) (R = RDIMM)	Form Factor	Power Supply Quantity (Std./Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std./Max)	CD-ROM (IDE)[6]	Bays: (Total/Avail)	Slots: (Total/Avail)
xSeries 340 / Netfinity 4500R At-A-Glance																
8656-2RY[1]	667	1/2	256	128 MB(R)/4 GB	Rack (3U)	1/2	P, H, F	O - Power[3] S- Fans	Y	10/100	D,U160	4/2[4]	0/218.4 GB[5]	24X- 10X	8/6[5]	5/5
8656-1RY[1]	733	1/2	256	128 MB(R)/4 GB	Rack(3U)	1/2	P, H, F	O - Power[3] S - Fans	Y	10/100	D,U160	4/2[4]	0/218.4 GB[5]	24X- 10X	8/6[5]	5/5
8656-3RY[1]	800	1/2	256	128 MB(R)/4 GB	Rack(3U)	1/2	P, H, F	O - Power[3] S - Fans	Y	10/100	D,U160	4/2[4]	0/218.4 GB[5]	24X- 10X	8/6[5]	5/5
8656-4RY[1]	866	1/2	256	128 MB(R)/4 GB	Rack(3U)	1/2	P, H, F	O - Power[3] S - Fans	Y	10/100	D,U160	4/2[4]	0/218.4 GB[5]	24X- 10X	8/6[5]	5/5
8656-5RY[1]	933	1/2	256	128 MB(R)/4 GB	Rack(3U)	1/2	P, H, F	O - Power[3] S - Fans	Y	10/100	D,U160	4/2[4]	0/218.4 GB[5]	24X- 10X	8/6[5]	5/5
8656-6RY[1, 7]	1 GHz	1/2	256	128 MB(R)/4 GB	Rack(3U)	1/2	P, H, F	O - Power[3] S - Fans	Y	10/100	D,U160	4/2[4]	0/218.4 GB[5]	24X- 10X	8/6[5]	5/5

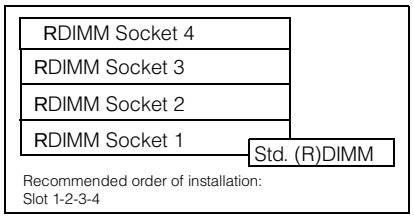
1. Housed in a 19" Rack mountable drawer and ships standard without a keyboard or mouse. See "Rack and NetBAY" under " Power, Monitor & Accessories" for supported IBM racks.
2. Intel Pentium III processor with 133 MHz front-side bus.
3. Power supply redundancy requires installation of optional 270 W Hot-Swap Redundant Power Supply (P/N 37L6880).
4. xSeries 340 / Netfinity 4500R includes two available removable media bays that can be converted to three slim-line (SL) hot-swap bays with the addition of optional 3-Pack Hot-Swap DASD Upgrade (P/N 33L5050), thus doubling internal hard disk drive storage capacity.
5. Assumes installation of optional Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit (P/N 33L5050) which converts the two available removable media bays into three slim-line (SL) hot-swap bays.
6. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
7. This model is an IBM xSeries 340.

xSeries 340 / Netfinity 4500R Processors

Part Number	Processor Upgrades with 256 KB Cache (Full Speed)	SMP Support[1]	Processor Speed Upgrade[2]
00N7949	Netfinity 667 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	2RY	-
00N7943	Netfinity 733 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	1RY	2RY
10K2338	Netfinity 800 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	3RY	All 1…2RY
19K4630	Netfinity 866 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	4RY	All 1…3RY
19K4631	Netfinity 933 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	5RY	All 1…4RY
19K4640	1 GHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	6RY	All …5RY

1. One additional processor may be installed, providing a maximum of two. All processors must be identical in type, speed, and cache size.
2. Requires removal of the standard processor. A maximum of two processors may be installed. All processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".

xSeries 340 / Netfinity 4500R Memory



Recommended order of installation:
Slot 1-2-3-4

Part Number	Memory Description[1]
33L3123	128 MB, 133 MHz SDRAM ECC RDIMM II
33L3125	256 MB, 133 MHz SDRAM ECC RDIMM II
33L3127	512 MB, 133 MHz SDRAM ECC RDIMM II
33L3129	1 GB, 133 MHz SDRAM ECC RDIMM II

1. The recommended order of installation is in sequence from Socket 1 to Socket 4. Memory size is not a factor.

Total Memory[1]	Quantity of RDIMMs Added			
128 MB (1 x 128) Models	128 MB (33L3123)	256 MB (33L3125)	512 MB (33L3127)	1 GB (33L3129)
256 MB	1	-	-	-
384 MB	2 or	1	-	-
512 MB	3	-	-	-
640 MB	-	2 or	1	-
896 MB	-	3	-	-
1024 MB	-	4[2]	-	-
1152 MB	-	-	2 or	1
1664 MB	-	-	3	-
2048 MB	-	-	4[2]	-
2176MB	-	-	-	2
3200 MB	-	-	-	3
4096 MB (max)	-	-	-	4[2]

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller RDIMMs may provide a more cost-effective alternative to using larger RDIMMs.
1. Network Operating Systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. Requires removal of standard memory.

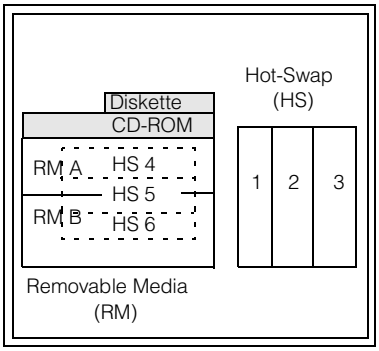
xSeries 340 / Netfinity 4500R Hard Disk Drive (HDD) and External Storage

Total Int. Storage[1]	7200RPM Hard Disk Drives (HDDs)			10,000RPM Hard Disk Drives (HDDs)		
	9.1 GB (P/N 36L9744 or P/N 37L7201)	18.2 GB (P/N 36L9745 or P/N 37L7202)	36.4 GB (P/N 37L7203)	9.1 GB (P/N 36L9748 or P/N 37L7204)	18.2 GB (P/N 36L9749 or P/N 37L7205)	36.4 GB (P/N 37L7206)
0 GB	Standard on Base Models			Standard on Base Models		
9.1 GB	1	-	-	1	-	-
18.2 GB	2	1	-	2	1	-
27.3 GB	3	-	-	3	-	-
36.4 GB	4[2]	2	1	4[2]	2	1
45.5 GB	5[2]	-	-	5[2]	-	-
54.6 GB	6[2]	3	-	6[2]	3	-
72.8 GB	-	4[2]	2	-	4[2]	2
91 GB	-	5[2]	-	-	5[2]	-
109.2 GB	-	6[2]	3	-	6[2]	3
145.6GB	-	-	4[2]	-	-	4[2]
182 GB	-	-	5[2]	-	-	5[2]
218.4 GB (max.)	-	-	6[2]	-	-	6[2]

This table does not represent all possible hard drive configurations.
1. Select a total storage row then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within +/- 0.2 GB unless otherwise noted.
2. Requires Netfinity 3-Pack Ultra 160 Hot-Swap Expansion Kit (P/N 33L5050).

Bay	Form Factor	Height	Front Access	Usage
-	89 mm (3.5")	-	Yes	Diskette
-	133 mm (5.25")	-	Yes	IDE CD-ROM
1…3	HS	SL[1]	Yes	Open
A, B	133 mm (5.25")	HH[2]	Yes	Open
4…6[3]	HS	SL[1]	Yes	Open

1. Half-High devices are NOT supported.
2 Two half-high (HH) bays can be combined to support a single full-high (FH) device. By installing Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit (P/N 33L5050), bays A and B are transformed into three SL hot-swap bays 4…6.
3. To enable bays 4…6, optional Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit (P/N 33L5050) is required.



Part Number	Description	RPM	Height	Bays Supported[2]	Max. Qty.
	Ultra2 Hard Disk Drives (HDD)				
36L9744	Netfinity 9.1 GB Wide Ultra2 SCSI Hot-Swap SL HDD	7200	SL	1…6	6[1]
36L9745	Netfinity 18.2 GB Wide Ultra2 SCSI Hot-Swap SL HDD	7200	SL	1…6	6[1]
36L9748	Netfinity 9.1 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	10,000	SL	1…6	6[1]
36L9749	Netfinity 18.2 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	10,000	SL	1…6	6[1]
	Ultra160 Hard Disk Drives (HDD)				
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1…6	6[1]
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1…6	6[1]
37L7203	36.4 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1…6	6[1]
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1…6	6[1]
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1…6	6[1]
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1…6	6[1]
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15000	SL	1…6	6[1]
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15000	SL	1…6	6[1]
	Associated Options				
33L5050	Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit[2]	-	3 x SL	4…6	-

	External Storage Expansion Units[3]	**Form Factor**
35301RU	Netfinity EXP200 Storage Expansion Unit[4]	Rack (3U)
37L0075	Netfinity EXP200 350 W Redundant Power Supply	-
35311RU	EXP300 Storage Expansion Unit[5]	Rack (3U)
35601RU	FAStT EXP500 Storage Expansion Unit[6]	Rack (3U)

1. Netfinity 4500R ships with Bays 1…3 enabled. To enable installation of greater than three HDDS requires Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit (P/N 33L5050).
2. Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit (P/N 33L5050) includes a hot-swap backplane and associated components for two cabling options. The backplane may be cabled directly to the second integrated SCSI channel or be supported by the same SCSI channel as the standard backplane through the use of an included repeater card.
3. Select an optional SCSI controller and then refer to Appendix D: Cables-Storage Units-Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
4. Netfinity EXP200 includes a single 2 M Ultra2 SCSI cable and single hot-swap 350W power supply and power cord. Optional hot-swap Netfinity EXP200 350W Redundant Power Supply (P/N 37L0075) includes an additional power cord.
5. EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500W redundant power supplies, each with its own power cord.
6. FAStT EXP500 Storage Expansion Unit (P/N 35601RU) includes dual hot-swap 350W power supplies, each with its own power cord.

xSeries 340 / Netfinity 4500R Internal SCSI Cabling

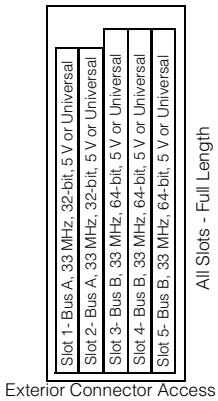
The xSeries 340 and Netfinity 4500R contain a DASD backplane supporting three hot-swap, SCA-2 compliant drive bays. The backplane is connected to one of the internal connectors of the integrated Ultra160 SCSI controller through a 16-bit LVD SCSI cable. A single-drop 16-bit SCSI cable is included with the server for attachment from the second internal Ultra160 connector to a removable media bay device. If an LVD attachment is required or more than one media bay device is required, a terminated two-drop 16-bit LVD SCSI cable available in the Netfinity Media Bay Conversion Kit (P/N 10K2340) must be ordered. No external SCSI port is included.

If optional Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit (P/N 33L5050) is installed in the removable media bays, four cabling options are possible. Included with this option is a 16-bit LVD SCSI cable, identical to the one used for attachment of the standard hot-swap backplane, which can be used to attach the optional 3-Pack Ultra160 Hot-Swap backplane directly to the second onboard SCSI connector or that of an optional RAID adapter. Alternatively, a repeater card and cable are

included which may be used to link the standard hot-swap backplane and optional hot-swap backplane together while utilizing the standard SCSI cable for attachment of the repeater card to one of the onboard SCSI connectors or that of an optional RAID adapter.

xSeries 340 / Netfinity 4500R I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported
	Storage Controllers[1]			
19K0564	Netfinity ServeRAID-3L Ultra2 SCSI Adapter II[2]	Full	32-bit	1...5
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter[3]	Full	32/64-bit	1...5
37L6091	ServeRAID-4L Ultra160 SCSI Controller[4]	Full	32/64-bit	1...5
37L6080	ServeRAID-4M Ultra160 SCSI Controller[5]	Full	32/64-bit	1...5
37L6889	ServeRAID-4H Ultra160 SCSI Controller[6]	Full	32/64-bit	1...5
19K4646	PCI Wide Ultra160 SCSI Adapter[17]	Half	32/64-bit	1...5
02K3454	PCI Fast/Wide Ultra SCSI Adapter[7]	Half	32-bit	1...5
	Fibre Storage Controllers and Options[8]			
35261RU	Netfinity Fibre Channel RAID Controller Unit	-	-	-
01K7296	Netfinity Fibre Channel Failsafe RAID Controller	-	-	-
00N6881	Netfinity FAStT Host Adapter	Half	32/64-bit	1...5
35521RU	FAStT500 Storage Server	-	-	-
35421RU	FAStT200 Storage Server	-	-	-
35422RU	FAStT200 HA Storage Server	-	-	-
19K1121	FAStT200 Redundant RAID Controller	-	-	-
00N6883	Netfinity FAStT500 256 MB Cache	-	-	-
2108R3S	SAN Data Gateway Router (Single-Ended)	-	-	-
2108R3D	SAN Data Gateway Router (Differential)	-	-	-
2109S08	SAN Fibre Channel Switch, 8-Port	-	-	-
2109S16	SAN Fibre Channel Switch, 16-Port	-	-	-
	Networking[9]			
	Ethernet			
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1...5
34L0301	Netfinity Gigabit Ethernet SX Adapter	Half	32/64-bit	1...5
	Token Ring			
34L0701	Token-Ring 16/4 PCIAdapter 2 with Wake on LAN[18]	Half	32-bit	1...5
	Communications[10]			
33L4618	PCI V.90 56 Data/Fax Modem[11]	Half	32-bit	1...5
	Systems Management[12]			
01K7209	Netfinity Advanced System Management PCI Adapter[13]	Full	32-bit	1...5[14]


Slot 1- Bus A, 33 MHz, 32-bit, 5 V or Universal
Slot 2- Bus A, 33 MHz, 32-bit, 5 V or Universal
Slot 3- Bus B, 33 MHz, 64-bit, 5 V or Universal
Slot 4- Bus B, 33 MHz, 64-bit, 5 V or Universal
Slot 5- Bus B, 33 MHz, 64-bit, 5 V or Universal
All Slots - Full Length
Exterior Connector Access

03K9309	Netfinity Advanced System Management Interconnect Cable Kit[15]	-	-	-
36L9654	Netfinity Adv6nced System Management Token-Ring Connection[16]	-	-	-
Host Attach				
9086001	Netfinity ESCON Adapter[19]	Full	32-bit	1...5[20]

1. xSeries 340 / Netfinity 4500R include a dual-port, dual-channel Ultra160 SCSI controller for internal use only. No standard external port is available. See "Internal SCSI Cabling" for cabling alternatives. Due to Netfinity 4500R's low profile, some adapters with connectors on the top edge may not have sufficient clearance to attach a cable. Cabling interferences are identified in the footnotes.
2. Netfinity ServeRAID-3L Ultra2 SCSI Adapter II (P/N 19K0564) provides either one internal or one external (0.8-mm VHDCI) LVDS SCSI channel.
3. Netfinity ServeRAID-3HB Ultra2 SCSI Adapter (P/N 37L6086) provides 2 external (0.8-mm VHDCI) LVDS SCSI channels. The internal connector is not accessible due to a cabling interference. Includes 32 MB of mirrored battery-backup cache which helps protect against data loss in write-back cache mode in the event of a power outage or adapter maintenance.
4. ServeRAID-4L Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8-mm VHDCI.
5. ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two external 0.8-mm VHDCI Ultra160 connectors.
6. ServeRAID-4H Ultra160 SCSI Controller is powered by a 266 MHz PowerPC 750 processor and provides 128 MB of battery-backed ECC cache. The internal connectors are not accessible due to cabling interference. Four external Ultra160 0.8-mm VHDCI connectors are available.
7. PCI Fast/Wide Ultra SCSI Adapter provides one external 68-pin high density connector. The internal connectors are not accessible due to a cabling interference.
8. See Fibre Array Solutions section for additional configuration information.
9. xSeries 340 / Netfinity 4500R include a full-duplex, 10/100 Mbps Ethernet PCI controller.
10. xSeries 340 / Netfinity 4500R include two USB ports, two serial and one parallel port.
11. Due to homologation variances, modem availability may differ by country.
12. The Netfinity Advanced Systems Management Processor and Interconnect Bus integrated into xSeries 340 / Netfinity 4500R works with Netfinity Director to provide significant system management function. When used with optional Netfinity Advanced System Management PCI Adapter (P/n 01K7209) and Netfinity Advanced System Management Interconnect Cable Kit (P/N 03K9309) additional management and control of up to 12 service processors from a remote console through a single modem or LAN connection is possible.
13. Includes PCI adapter, Netfinity Advanced System Management Interconnect Cable Kit components and 56-watt AC adapter, which requires a separate power source. Provides an integrated 10/100 Ethernet port and a PCMCIA slot to support optional Netfinity Advanced System Management Token-Ring Connection (P/N 36L9654).
14. A maximum quantity of one is supported.
15. Required for all xSeries and Netfinity Servers containing a standard Advanced System Management Processor that are to be interconnected for system management support through a LAN or modem connection (Netfinity 5500 models 8660- 1...4xU are not supported). Optional Netfinity Advanced System Management PCI Adapter (P/N 01K7209) includes the contents of this option.Up to 12 service processors may be interconnected (including standard and optional processors) with an aggregate connection length of no more than 91.4 meters (300 ft.). A customer-supplied Ethernet cable is required for each interconnection.
16 Contains an IBM Turbo 16/4 Token-Ring PCI card, which installs in the PCMCIA card slot of Netfinity Advanced System Management PCI Adapter (P/N 01K7209), and a PC Card to 9-pin D-Shell cable which is routed to an available adapter slot opening (reduces available slots by one). The Netfinity Advanced System Management PCI Adapter's integrated Ethernet port and Netfinity Advanced System Management Token-Ring Connection cannot be connected or used together.
17. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilized.
18. The Wake on LAN function of this option is not supported by this server.
19. Provides an ESCON MIC and a DB9 Serial Port. Cables are not included but are available through S/390 channels. Contact your IBM representative for additional information.
20. A maximum of two 9086001 adapters (installed in non-adjacent slots) are supported in a single server.

xSeries 340 / Netfinity 4500R Power, Monitor & Accessories

Part Number	Description
	Power[1]
37L6880	270 W Hot-Swap Redundant Power Supply
	Uninterruptible Power Supply (UPS)[2]
94G6674	APC Smart-UPS 1400RMB[3]
94G6676	APC Smart-UPS 3000RMB[3]
37L6861	APC Smart-UPS 5000RMB[4]
	Monitors[5]
633347N	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
6331B2N	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
6332J1N	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[6]
66274AN	G78 Color Monitor 17" (406.4-mm, 16" Viewable Image Size), stealth black[6]
9511AG1	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable), stealth black[7]

1. xSeries 340 / Netfinity 4500R include a single 270 W, hot-swap power supply and a single 9 ft. 110 V power cord with an IEC 320-C13 connector on the system end and NEMA 5-15P on the other end. Power supply redundancy can be achieved with the addition of optional 270 W Hot-Swap Redundant Supply (P/N 37L6880).
2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
3. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
4. Height is 5U. See "Rack and NetBAY" for supported IBM racks.
5. xSeries 340 / Netfinity 4500R use an SVGA controller (S3 Savage4 chipset) with 8 MB of video memory.
6. Installation within a rack requires optional Monitor Compartment (P/N 94G7444).
7. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit II (P/N 37L6888) and Netfinity Rack Keyboard Tray (P/N 28L4707). A space saver keyboard may coexist within the same 28L4707 keyboard tray.

Part Number	Description
Rack and NetBAY[1]	
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack
9306910	Netfinity Rack (includes perforated front door)
9306200	Netfinity NetBAY22
Keyboard and Mouse[2]	
28L3644	Space Saver II Keyboard[3, 5]
01K1260	TrackPoint IV 104-Key Black Keyboard[4, 5]
28L3621	Preferred Keyboard (stealth black)[4]
28L3673	Sleek 2-Button Stealth Black Mouse

1. xSeries 340 / Netfinity 4500R are housed in a 19" rack mountable drawer and requires one of the racks listed here. See IBM Netfinity Rack Cabinet and Options section for IBM rack supported devices.
2. xSeries 340 / Netfinity 4500R ship without a keyboard or mouse.
3. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
4. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.
5. Advanced TrackPoint IV features are not available on IBM Netfinity systems.

xSeries 340 / Netfinity 4500R Tape Options

Part Number	Description	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive[2]	A, B	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	Y	N/A	3551001[1]
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive	A, B	16	133 mm (5.25") HH	N[3]	N/A	3551001
09N4040	20/40 GB DLT Internal SCSI Tape Drive	A/B	8	133 mm (5.25") FH	N[3]	Y	3551001
00N7990	40/80 GB DLT Internal SCSI Tape Drive[2]	A/B	16 Ultra2 LVD	133 mm (5.25") FH	N[3]	N/A	3551001[1]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive[2]	A, B	16 Ultra2 LVD	133 mm (5.25") HH	N[3]	N/A	3551001[1]
Tape Autoloaders							
00N7992	120/240GB DDS/4 Tape Autoloader[2]	A/B	16 Ultra2 LVD	133 mm (5.25") FH	N[3]	N/A	3551001[1]
External Tape Libraries[4]							
3502R14	DLT Tape Library	-	16	Rack	Y	N/A	-
External Tape Enclosures							
3551001	NetMEDIA Storage Expansion Unit EL[5]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[6]	-	16 LVD	-	N	N	3551001
Associated Options							
10K2340	Media Bay Tray and LVD Cable Kit[7]	-	16 LVD	Int.	Y	N	3551001

Note: xSeries 340 / 4500R includes a single drop, 16-bit, single-ended, non-terminated SCSI cable for attachment of a device in Bay A or B to the second integrated Ultra160 SCSI channel or supported adapter. No external SCSI port is available. All tape drives and enclosures are supported by PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which has an external 0.8-mm VHDCI connector.
1.LVD support for LVD devices installed in a NetMEDIA Storage Expansion Unit EL (P/N 3551001) requires replacement of the standard single-ended internal cables with one or more (depending on configuration) cables from Media Bay Tray and LVD Cable Kit (P/N 10K2340) which contains a single two-drop multi-mode terminated cable. If the standard cables are used for attachment to LVD devices, single-ended SCSI rules and bus speeds apply.
2. LVD support for LVD devices requires installation of the 16-bit multi-mode terminated, two-drop, LVD SCSI cable included with optional Media Bay Tray and LVD Cable Kit (P/N 10K2340)
3. Termination requires installation of the multi-mode terminated, two-drop, LVD SCSI cable included with optional Media Bay Tray and LVD Cable Kit (P/N 10K2340)
4. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
5. NetMEDIA Storage Expansion Unit EL (P/N 3551001) is a black 3U, 19" rack or NetBAY3/3E mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included.
6. NetMEDIA Systems Management Adapter (P/N 10L7113) may be installed in a 3551001 to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the 3551001 is powered off. External connector is 0.8-mm VHDCI.
7. Media Bay Tray and LVD Cable Kit (P/N 10K2340) includes an internal two-drop multi-mode terminated LVD SCSI cable.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.

xSeries 340 / Netfinity 4500R Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

Internet Server

Part Number	Description	Quantity
8656-5RY	xSeries 340Pentium III 933 MHz/256 KB L2, 128 MB ECC, OPEN, 24X, PCI (Rack 3U)	1
33L3123	128 MB SDRAM ECC RDIMM II[1]	1
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD[2]	1
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive	3
10K2340	Media Bay Tray and LVD Cable Kit	1
6331B2N	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black	1
94G6674	APC Smart-UPS 1400RMB	1
37L6880	270 W Hot-Swap Redundant Power Supply	
	Industry Standard 19" Rack, EIA-310D, min. depth of 28" (711 mm)	
9306200	Netfinity NetBAY22	1
28L3644	Space Saver II Keyboard	1
94G6670	Blank Filler Kit	2

1. For a total of 256 MB of system memory.
2. For a total of 27.3 GB of RAID protected hot-swap, hot-spare internal storage.

An internet server is a server that handles all requests from the Internet (intranet or extranet). Usually this type of server has the same characteristics as a file server. The main difference is that an internet server talks a different language (TCP/IP vs. NETBEUI or IPX/SPX) and often needs to do an extra security check (Firewall). In the case of an internet server, the server itself talks mostly to just one client, the Internet Service Provider (ISP), instead of many clients like a file server does.

With this in mind the xSeries 340 was selected to provide an affordable price point for the growing internet server market, 256 MB of system memory (expandable to 4 GB), and availability features such as RAID protected internal hot-swap storage and power protection with an APC Smart-UPS.

The network configuration depends on the method that will be used to connect the server to the internet. Usually fast Ethernet routers are used, but if other methods are used, you can add the appropriate adapter. The configuration includes a tape backup unit for secure backup of critical data in the event of a system or storage failure.

Application Server

Part Number	Description	Quantity
8656-6RY	xSeries 340 Pentium III 1 GHz/256 KB L2, 128 MB ECC, OPEN, 24X, PCI (Rack 3U)	1
19K4630	xSeries1 GHz Upgrade with 133 FSB and 256 KB Advanced Transfer Cache Pentium III Processor	1
33L3125	256 MB 133 MHz SDRAM ECC RDIMM II	1
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD	3
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive	1
10K2340	Media Bay Tray and LVD Cable Kit	1
6331B2N	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black	1
37L6880	Netfinity 270 W Hot-Swap Redundant Power Supply	1
94G6674	APC Smart-UPS 1400RMB	1
	Industry Standard 19" Rack, EIA-310D, min. depth of 28" (711 mm)	
9306200	Netfinity NetBAY22	1
28L3644	Space Saver II Keyboard	1
94G6670	Blank Filler Kit	2

1. For a total of 384 MB of system memory.
2. For a total of 54.6 GB of usable RAID 5 storage.

An application server is designed to handle a high workload while providing application serving requirements for users. With this in mind, the xSeries 340 was selected to provide an affordable price point for an application server, with two-way Pentium III processing, 384 MB of system memory (expandable to 4GB),and availability features such as battery-backed cache, RAID protected internal hot-swap storage and power protection with an APC Smart-UPS.

High-Availability 4500R Cluster (P/N 19K8605)[1]

Part Number	Description[2]	Quantity
8656-2RY	Netfinity 4500R Pentium III 667 MHz/256 KB L2, 128 MB ECC, OPEN, 24X, PCI (Rack 3U)	2
37L7201	Netfinity 9.1 GB Ultra160 SCSI Hot-Swap SL HDD	2
19K0564	Netfinity ServeRAID-3L Ultra2 SCSI Adapter II	4
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	2
	Storage Subsystem	
35301RU	Netfinity EXP200 Storage Expansion Unit	1
36L9748	Netfinity 9.1 GB 10K-3 Eide Ultra2 SCSI Hot-Swap SL HDD	5
03K9310	Netfinity 2M Ultra2 SCSI Cable	1
37L0075	Netfinity EXP200 350 W Redundant Power Supply	1
	Rack Mounting and Support Devices	
9306200	Netfinity NetBAY22	1
94G6666	100-120V Power Distribution Unit	2

9513AG1	T55A Flat Panel Color Monitor (381-mm, 15.0" Viewable Image Size), stealth black	1
28L0542	Netfinity Console Server Selector Switch (4-port)	1
94G7447	NetBAY Console Cable Set-12 ft. (3.66 m)	2
28L3644	Space Saver Keyboard	1
28L4707	Netfinity Rack Keyboard Tray	1
37L6857	Flat Panel Monitor Rack Mount Kit	1
Cluster Interconnect		
76H0551	Ethernet Cluster Interconnect Cable[3]	1
	Cluster Options[4]	
00N7949	Netfinity 667 MHz 133 FSB/256KB Upgrade with Pentium III Processor	2
01K7262	Netfinity 128 MB SDRAM ECC RDIMM	2
36L9748	Netfinity 9.1 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	5
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter	1
01K7209	Netfinity Advanced System Management PCI Adapter	1
03K9309	Netfinity Advanced System Management Interconnect Cable Kit	1
33L4618	PCI V.90 56 Data/Fax Modem	2
00N7990	40/80GB DLT Internal SCSI Tape Drive	1
94G3136	APC Smart-UPS 1400	1

1. The High-Availability 4500R Cluster is a complete rack solution comprised of IBM Netfinity 4500R Servers (P/N 8656-2RY). This solution includes the choice of Microsoft Windows NT Enterprise Edition or Microsoft Windows 2000 Advanced Server (each includes Microsoft Cluster Services (MCS) functions). Additional options are supported to provide flexibility to handle more robust applications.
2. Hardware configurations are subject to change as new products are tested that will enhance the solution. To view the most current Netfinity High-Availability 4500R Cluster configurations, visit our web site at: http://www.pc.ibm.com/us/netfinity/4500rcluster.html.
3. This part cannot be ordered separately from the Netfinity High-Availability 4500R Cluster solution.
4. These options are available for your purchase as part of the Netfinity High-Availability 4500R Cluster.

IBM Netfinity 1000 Configurator

Part Number	Processor Speed (MHz)	Number of Processors (Std/Max)	L2 ECC Cache. (KB)	Memory (Std/Max) R=RDIMM	Form Factor	Power Supply Quantity (Std/Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor	Onboard Ethernet	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std/Max)	CD-ROM (IDE)[1]	Bays: (Total/Avail)	Slots: (Total/Avail)
8477-31Y[3]	550[2]	1/1	512	64/768 MB	Tower	1/1	-	-	-	10/100	U	4/2	0/145.6 GB	40X-17X	6/4	6/5
8477-52Y[3]	650[2]	1/1	256	128/768 MB	Tower	1/1	-	-	-	10/100	U2	4/2	9.1/145.6 GB	40X-17X	6/3	6/5
8477-62Y[3]	700[2]	1/1	256	128/768 MB	Tower	1/1	-	-	-	10/100	U2	4/2	9.1/145.6 GB	40X-17X	6/3	6/5

1. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
2. Intel Pentium III processor
3. Netfinity 1000 SCSI models are not available in the Americas.

Netfinity 1000 Processor Upgrades

Part Number	Processor Upgrades with 512KB Cache	Processor Speed Upgrade[1]
36L9673	Netfinity 500 MHz/512 KB Upgrade with Pentium III Processor	All 1xY
33L5112	Netfinity 550 MHz/512 KB Upgrade with Pentium III Processor	All 1…2xY
33L5106	Netfinity 600 MHz/512 KB Upgrade with Pentium III Processor	All 1…3xY
10K2164	Netfinity 650 MHz/256 KB Upgrade with Pentium III Processor	All 1…3xY
10K2165	Netfinity 700 MHz/256 KB Upgrade with Pentium III Processor	All 1…3xY, 52Y

1. Requires removal of the standard processor. A maximum of one processor may be installed. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".

Netfinity 1000 Memory

DIMM Socket
DIMM Socket
DIMM Socket

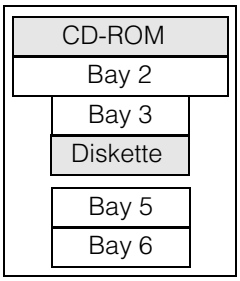
Part Number	Memory Description
01K1133	32 MB 100 MHz ECC SDRAM DIMM
01K1130	64 MB 100 MHz ECC SDRAM DIMM
01K1131	128 MB 100 MHz ECC SDRAM DIMM
01K1132	256 MB 100 MHz ECC SDRAM Registered RDIMM[1]

1. P/N 01K1132 is a registered DIMM and is not compatible with 01K1130, 01K1131, or 01K1133. Installation of this RDIMM requires replacement of the standard DIMM.

Total Memory	64 MB Models	128 MB Models
64 MB	64 MB DIMM standard	-
128 MB	1 x 01K1130	128 MB DIMM standard
192 MB	1 x 01K1131	1 x 01K1130
256 MB	1 x 01K1131, 1 x 01K1130	1 x 01K1131
320 MB	2 x 01K1131	1 x 01K1131, 1 x 01K1130
384 MB	3 x 01K1131[1]	2 x 01K1131
512 MB	2 x 01K1132[1]	2 x 01K1132[1]
768 MB (max)	3 x 01K1132[1]	3 x 01K1132[1]

This table does not represent all possible memory configurations.
1. Replace standard DIMM.

Netfinity 1000 Hard Disk Drive (HDD) Storage



Total Internal Storage[1]	Open Bay Examples[2] — 7200RPM Hard Disk Drives (HDDs)		
	9.1 GB (P/N 20L0553 or P/N 00N8204)	18.2 GB (P/N 20L0554 or P/N 00N8205)	36.4 GB (P/N 00N8206)
9.1 GB	1	-	-
18.2 GB	2	1	-
27.3 GB	3	-	-
36.4 GB	4	2	1
45.5 GB	-	-	-
54.6 GB	-	3	-
72.8 GB	-	4	2
91 GB	-	-	-
109.2 GB	-	-	3
145.6 GB (max)	-	-	4

This table does not represent all possible hard drive configurations.
1. Total Internal Storage listed is within +/- 0.2 GB unless otherwise noted.
2. Select a total storage row and then select the quantity of HDDs from a column corresponding to the appropriate hard disk drive. When configuring disk drive models (8477-x2Y) which include a single 9.1 GB 7200 RPM HDD, use the 9.1 GB 7200 RPM column and order one less HDD than the table indicates.

Bay	Form Factor	Height	Front Access	Usage
1	133 mm (5.25")	HH	yes	IDE CD-ROM
2	133 mm (5.25")[1]	HH	yes	open
3	89 mm (3.5")	SL	yes	open
5, 6	89 mm (3.5")	SL[2]	no	open

1. A 3.5" conversion kit is standard in Bay 2 for installation of 3.5" hard disk drives.
2. Two slim-line (SL) bays can be combined to support a single half-high (HH) device.

Part Number	Description	RPM	Height	Bays Supported	Max. Qty.
Ultra2 Hard Disk Drives (HDD)[1]					
20L0553	9.1 GB Wide Ultra2 SCSI HDD	7200	SL	2,3,5,6	4
20L0554	18.2 GB Wide Ultra2 SCSI HDD	7200	SL	2,3,5,6	4
Ultra160 Hard Disk Drives (HDD)[1]					
00N8204	9.1GB 7200 rpm Ultra160 SCSI HDD	7200	SL	2,3,5,6	4
00N8205	18.2GB 7200 rpm Ultra160 SCSI HDD	7200	SL	2,3,5,6	4
00N8206	36.4GB 7200 rpm Ultra160 SCSI HDD	7200	SL	2,3,5,6	4

External Storage Expansion Units[2]		Form Factor
35301RU	Netfinity EXP200 Storage Expansion Unit[3]	Rack (3U)
37L5857	Netfinity EXP200 Rack-to-Tower Conversion Kit	-
37L0075	Netfinity EXP200 350 W Redundant Power Supply	-

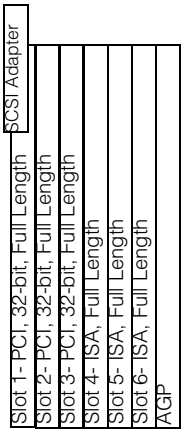
1. Netfinity 1000 contains an Ultra SCSI controller and cable which limits Ultra2 and Ultra160 HDDs to Ultra bus speeds.
2. Not supported by the onboard external SCSI port. Select an optional SCSI controller then refer to see Appendix D: Cables-Storage Units-Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
3. Netfinity EXP200 includes a single 2 M Ultra2 SCSI cable and a single hot-swap 350W power supply and power cord. Optional hot-swap Netfinity EXP200 350W Redundant Power Supply (P/N 37L0075) includes an additional power cord. To convert an EXP200 to match the system's tower form factor, Netfinity EXP200 Rack-to-Tower Conversion Kit (P/N 37L5857) is required.

Netfinity 1000 (SCSI models) Internal SCSI Cabling

Netfinity 1000 SCSI models 8477-3xY and below have an IBM PCI Fast/Wide Ultra SCSI Adapter while SCSI models 5xY and up have a PCI Wide Ultra2 SCSI Adapter and support up to four internal SCSI devices through the 16-bit internal connector or 15 external SCSI devices through the 16-bit external 68-pin High Density connector; however, when internal SCSI devices are installed to the internal connector, only one SCSI device can be supported from the external connector. All models are cabled internally with a four-drop, 16-bit wide SCSI cable (SCSI models 5xY and up contain an Ultra2 SCSI cable) with a built-in active terminator at one end. The other end is attached to the internal 68-pin connector of the SCSI adapter. On the drive models, the hard disk drive (HDD) is attached to the cable connector closest to the active terminator. On open bay models the first disk drive installed should be attached in the same manner. In the event the standard four drop cable is attached to a RAID controller and a dedicated removable media attachment to the onboard controller is required, an optional, terminated, 16-bit cable is available (Netfinity Two-Drop Internal SCSI Cable P/N 36L9636). This is not an Ultra2 cable; therefore attached devices will operate as Ultra or slower devices. If connecting narrow devices to this cable, additional 68-pin to 50-pin converters (P/N 32G3925) must be ordered. Some narrow devices include a converter in their ship groups.

Netfinity 1000 I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported
	Storage Controllers[1]			
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter[2]	Full	32/64-bit	3
19K4646	PCI Wide Ultra160 SCSI Adapter[8]	Half	32/64-bit	1, 2, 3
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	1, 2, 3
	Networking[3]			
	Ethernet			
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1, 2, 3
09N9901	10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1, 2, 3
34L0301	Netfinity Gigabit Ethernet SX Adapter	Half	32/64-bit	1, 2, 3
	Token Ring			
34L5001	16/4 Token-Ring PCI Management Adapter	Half	32-bit	1, 2, 3
34L5201	High-Speed 100/16/4 Token-Ring PCI Management Adapter	Half	32-bit	1, 2, 3
	Communications			
33L4618	PCI V.90 56 Data/Fax Modem[4]	Half	32-bit	1, 2, 3
37L14xx	Serial I/O SST 8, 16 and 128 Port Adapters[5]	Half	32-bit	1, 2, 3
	Systems Management[6]			
94G7578	PC Server Advanced Systems Management Adapter	Full	ISA	4, 5, 6
94G5571	Advanced Systems Management Power Unit[7]	-	-	-


SCSI Adapter
Slot 1- PCI, 32-bit, Full Length
Slot 2- PCI, 32-bit, Full Length
Slot 3- PCI, 32-bit, Full Length
Slot 4- ISA, Full Length
Slot 5- ISA, Full Length
Slot 6- ISA, Full Length
AGP

1. Netfinity1000 models 8477 3xY and below include a single PCI Fast/Wide Ultra SCSI Adapter while models 52Y and up include a PCI Wide Ultra2 SCSI Adapter.
2. Netfinity ServeRAID-3HB Ultra2 SCSI Adapter (P/N 37L6086) provides one internal and 2 external (0.8mm VHDCI) LVDS SCSI channels. The internal channel can be configured for external usage (0.8mm VHDCI) providing a total of 3 external LVDS SCSI channels. Includes 32 MB of mirrored battery-backup cache which helps protect against data loss in write-back cache mode in the event of a power outage or adapter maintenance.
3. Netfinity 1000 has an integrated 10/100 PCI Ethernet Controller.
4. Due to homologation variances, modem availability may differ by country.
5. See Appendix E for details on Serial I/O options and configuration limitations.
6. Netfinity 1000 provides the following integrated system management features - Vital Product Data (VPD) plus thermal, voltage, and fan sensors. For additional functions, optional PC Server Advanced Systems Management (P/N 94G7578) may be utilized. To enable the adapter's Automated Restart and Alerting as well as Remote Power On/Off features, Advanced Systems Management Power Unit (P/N 94G5571) is required.
7. Provides continuous power to the PC Server Advanced Systems Management Adapter (P/N 94G7578) even when the system is powered off.
8. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilized.

Netfinity 1000 Power, Monitor & Accessories

Part Number	Description
	Power[1]
	Uninterruptible Power Supply (UPS)[2]
94G3134	APC Smart-UPS 700
94G3135	APC Smart-UPS 1000
	Monitors
633347N	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black
6331B2N	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black
6332J1N	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black
66274AN	G78 Color Monitor 17" (406.4-mm, 16.0" Viewable Image Size), stealth black
9511AG1	T54A TFT LCD Color Monitor(306-mm x 230-mm, 15.0" Viewable), stealth black

1. Netfinity 1000 includes a 330 W voltage sensing power supply.
2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.

Netfinity 1000 Tape Options

Part Number	Description	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures[1]
09N4041	12/24GB DDS/3 4-mm Internal SCSI Tape Drive[2, 4]	2	8	89 mm (3.5") HH or 133 mm (5.25") HH	Y	Y	3510020
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive, 4[3, 5]	2	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	Y	N/A	3510020
09N4042	10/20 GB NS Internal SCSI Tape Drive[2, 4]	2, 3	8	89 mm (3.5") SL or 133 mm (5.25") HH	Y	Y	3510020
	External Tape Enclosures						
3510020	External Half High SCSI Storage Enclosure[6]	-	8/16	Desktop	N	N	-
	Associated Options						
10K2340	Media Bay Tray and LVD Cable Kit[7]	-	16 LVD/SE	Internal	Y	N	3551001

Note: Models 8477-52Y and above include an Ultra2 SCSI controller with a four-drop multi-mode terminated LVD SCSI cable. Single-Ended devices attached to this cable will limit the entire SCSI bus to single-ended performance. Models 8477-31Y and below include an Ultra SCSI controller with a four-drop, 16-bit single-ended terminated SCSI cable. Support of LVD devices attached to this cable limits the LVD device to a maximum of Ultra SCSI bus speeds. All tape drives and external tape enclosures are supported by PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which includes a five-drop multi-mode LVD SCSI cable and an external 0.8-mm VHDCI connector.

1. To determine external cable requirements, note the tape drive's SCSI interface, the appropriate SCSI controller from the system configurator section, and the desired enclosure, and then refer to Appendix D: Cables - Storage Units - Controllers.
2. This single-ended device will limit the SCSI bus of models 8477-52Y and above to Ultra SCSI speeds. To provide a dedicated tape SCSI bus, install PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which includes a five-drop multi-mode LVD SCSI cable.
3. Models 8477-31Y and below will support LVD tape drives attached to the standard cable, however, bus speeds will be restricted to Ultra SCSI or below. For LVD support, optional PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) may be installed (includes required terminated LVD cable).
4. RAID configurations where the standard SCSI cable is attached to a RAID adapter require the two-drop multi-mode terminated LVD SCSI cable included with Media BayTray and LVD Cable Kit (P/N 10K2340) for attachment of the tape drive to the standard controller.
5. RAID configurations where the standard SCSI cable is attached to a RAID adapter require the two-drop multi-mode terminated LVD SCSI cable included with Media BayTray and LVD Cable Kit (P/N 10K2340) for attachment of the tape drive to the standard controller. For LVD support, optional PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) may be installed (includes required terminated LVD cable.
6. Provides a black desktop 133-mm (5.25") half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
7. Media BayTray and LVD Cable Kit (P/N 10K2340) includes an internal two-drop multi-mode terminated LVD SCSI cable.

NOTE: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.

Netfinity 1000 Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

Workgroup Intranet Server

Part Number	Description	Quantity
8477-62Y	Netfinity 1000 (Pentium III 700/128 MB/0 GB)	1
01K1130	64 MB 100 MHz ECC SDRAM DIMM [1]	1
20L0553	9.1 GB Wide Ultra2 SCSI HDD	3
09N4042	10/20 GB NS Internal SCSI Tape Drive	1
6331B2N	E54 Color Monitor 15" (350 mm, 13.8" Viewable Image Size), stealth black	1
94G3135	APC Smart-UPS 1000	1

1. For a total of 192 MB of system memory.

An Internet server is a server that handles all requests from the Internet (Intranet or Extranet). Usually, this type of server has the same characteristics as a normal file server. The main difference is that an Internet server talks a different language (TCP/IP vs. NETBEUI or IPX/SPX) and often needs to do an extra security check (firewall). In the case of an Internet server, the server itself talks mostly to just one client, the Internet Service Provider (ISP), instead of many clients like a file server does.

With this in mind, the IBM Netfinity 1000 was selected to provide an affordable price point for the growing Internet server market with Pentium III processing, 192 MB of system memory (expandable to 768 MB), integrated 10/100 Ethernet controller, high-performance storage, and power protection with an APC Smart-UPS. The configuration includes a tape backup unit for secure backup of critical data in the event of a system or storage failure.

File and Print Server

Part Number	Description	Quantity
8477-52Y	Netfinity 1000 (Pentium II 650/128 MB/0 GB)	1
01K1130	64 MB 100 MHz ECC SDRAM DIMM[1]	1
20L0553	9.1 GB Wide Ultra2 SCSI HDD	1
09N4042	10/20 GB NS Internal SCSI Tape Drive	1
6331B2N	E54 Color Monitor 15" (350 mm, 13.8" Viewable Image Size), stealth black	1
94G3134	APC Smart-UPS 700	1

1. For a total of 192 MB of system memory.

A small business or departmental server is usually required to perform all typical server functions while servicing up to 50 users in a normal workgroup computing environment, but doesn't require the high-end performance and fault tolerance properties of larger servers.

The sample configuration above consists of an IBM Netfinity 1000 with 192MB of memory and 9.1 GB of hard disk space. It has enough processor power and memory to run most current network operating systems comfortably and enough hard disk drive space to store a significant amount of data with additional internal storage expansion still available. Demanding network traffic is effectively handled by the standard 100 Mbps Ethernet connection.
This configuration also includes a tape backup unit, monitor, and a UPS to keep the system protected from power surges and outages.

IBM Netfinity 1000 (IDE) Configurator

Part Number	Processor Speed (MHz)	Number of Processors (Std/Max)	L2 ECC Cache. (KB)	Memory (Std/Max) (R=RDIMM)	Form Factor	Power Supply Quantity (Std/Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor	Onboard Ethernet	Storage Controller	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std/Max)	CD-ROM (IDE)	Bays: (Total/Avail)	Slots: (Total/Avail)
8477-42Y[3]	600[1]	1/1	512	64/768 MB	Tower	1/1	-	-	-	10/100	IDE	4/2	10.1/30.3 GB	40X-17X[2]	6/3	6/6
8477-51Y[3]	650[1]	1/1	256	64/768 MB	Tower	1/1	-	-	-	10/100	IDE	4/2	10.1/30.3 GB	40X-17X[2]	6/3	6/6
8477-61Y[3]	700[1]	1/1	256	64/768 MB	Tower	1/1	-	-	-	10/100	IDE	4/2	10.1/30.3 GB	40X-17X[2]	6/3	6/6

1. Intel Pentium III processor.
2. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
3. Netfinity 1000 (IDE models) are not available in Canada or Latin America.

Netfinity 1000 (IDE) Processor Upgrades

Part Number	Processor Upgrades with 512KB Cache	Processor Speed Upgrade[1]
10K2165	Netfinity 700 MHz/256 KB Upgrade with Pentium III Processor	42Y, 51Y

1. Requires removal of the standard processor. A maximum of one processor may be installed. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".

Netfinity 1000 (IDE) Memory

DIMM Socket
DIMM Socket
DIMM Socket

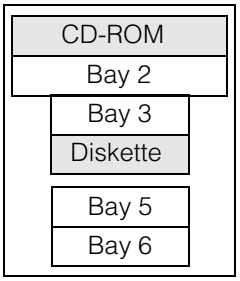
Part Number	Memory Description
01K1133	32 MB 100 MHz ECC SDRAM DIMM
01K1130	64 MB 100 MHz ECC SDRAM DIMM
01K1131	128 MB 100 MHz ECC SDRAM DIMM
01K1132	256 MB 100 MHz ECC SDRAM Registered DIMM[1]

1. P/N 01K1132 is a registered DIMM and is not compatible with 01K1130, 01K1131, or 01K1133. Installation of this RDIMM requires replacement of the standard DIMM.

Total Memory	All Models
64 MB	64 MB DIMM Standard
128 MB	1 x 01K1130
192 MB	1 x 01K1131
256 MB	1 x 01K1131, 1 x 01K1130
320 MB	2 x 01K1131
384 MB	3 x 01K1131[1]
512 MB	2 x 01K1132[1]
768 MB (max)	3 x 01K1132[1]

This table does not represent all possible memory configurations.
1. Replace standard DIMM.

Netfinity 1000 (IDE) Hard Disk Drive (HDD) Storage



Total Internal Storage[1]	All Models
10.1 GB	Standard
20.2 GB	1 x 33L4958
30.3 GB	2 x 33L4958

This table does not represent all possible hard drive configurations.
1. Total Internal Storage listed is within ± 0.2 GB unless otherwise noted.

Bay	Form Factor	Height	Front Access	Usage
1	133 mm (5.25")	HH	yes	IDE CD-ROM
2	133 mm (5.25")[1]	HH	yes	open
3	89 mm (3.5")	SL	yes	open
5, 6	89 mm (3.5")	SL[2]	no	open

1. A 3.5" conversion kit is standard in Bay 2 for installation of 3.5" hard disk drives.
2. Two slim-line (SL) bays can be combined to support a single half-high (HH) device.

Part Number	Description	RPM	Height	Bays Supported	Max. Qty.
Internal IDE Hard Disk Drives (HDD)					
33L4958	10.1 GB 7200rpm EIDE HDD[1]	7200	SL	2, 3, 5, 6	3

1. This HDD is only supported in the Netfinity 1000(IDE) (model 8477-42Y).

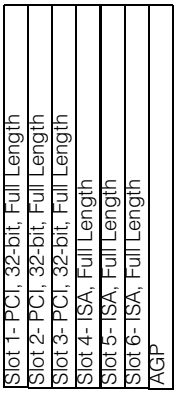
Netfinity 1000 (IDE models) Internal Cabling

Netfinity 1000 (IDE) systems have an onboard IDE Storage Controller that provides support for up to four internal IDE devices. All models of the Netfinity 1000 (IDE) include an IDE CD-ROM drive and one 10.1 GB 7200rpm EIDE Hard Disk Drive. This allows for the addition of up to two additional IDE devices.

Netfinity 1000 (IDE) I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported
	Storage Controllers[1]			
02K3454	PCI Fast/Wide Ultra SCSI Adapter[2]	Half	32-bit	1, 2, 3
	Networking[3]			
	Ethernet			
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1, 2, 3
	Token Ring			
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN[4]	Half	32-bit	1, 2, 3
34L5201	High-Speed 100/16/4 Token-Ring PCI Management Adapter	Half	32-bit	1, 2, 3
	Communications			
33L4618	PCI V.90 56 Data/Fax Modem[5]	Half	32-bit	1, 2, 3
37L14xx	Serial I/O SST 8, 16 and 128 Port Adapters[6]	Half	32-bit	1, 2, 3
	Systems Management[7]			

1. Netfinity 1000 (IDE) ships with integrated IDE controllers and cables for support of up to 3 hard disk drives. Optional SCSI support is limited to tape drives only. No SCSI hard disk drives are supported.
2. Supports attachment of internal tape drives only. Includes 16-bit SCSI cable.
3. Netfinity1000 (IDE) has an integrated 10/100 PCI Ethernet Controller.
4.The Wake on LAN function of this option is not supported by Netfinity Servers.
5. Due to homologation variances, modem availability may differ by country.
6. See Appendix E for details on Serial I/O options and configuration limitations.
7. Netfinity 1000 (IDE) provides the following integrated system management features - Vital Product Data (VPD) plus thermal, voltage, and fan sensors.


Slot 1- PCI, 32-bit, Full Length
Slot 2- PCI, 32-bit, Full Length
Slot 3- PCI, 32-bit, Full Length
Slot 4- ISA, Full Length
Slot 5- ISA, Full Length
Slot 6- ISA, Full Length
AGP

Netfinity 1000 (IDE) Power, Monitor & Accessories

Part Number	Description
	Power[1]
	Uninterruptible Power Supply (UPS)[2]
94G3134	APC Smart-UPS 700
94G3135	APC Smart-UPS 1000
	Monitors
633347N	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black
6331B2N	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black
6332J1N	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black
66274AN	G78 Color Monitor 17" (406.4-mm, 16.0" Viewable Image Size), stealth black
9511AG1	T54A TFT LCD Color Monitor(306-mm x 230-mm, 15.0" Viewable), stealth black

1. Netfinity 1000 includes a 330 W voltage sensing power supply.
2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.

Netfinity 1000 (IDE) Tape Options

Part Number	Description	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Incl.	68/50-Pin Convertor Incl.	Ext. Tape Enclosures
09N4042	10/20 GB NS Internal SCSI Tape Drive[1]	2, 3	8	89 mm (3.5") SL or 133 mm (5.25") HH	Y	Y	N/A

1.Requires PCI Fast/Wide Ultra SCSI Adapter (P/N 02K3454) which includes a SCSI cable.

Netfinity 1000 (IDE) Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

Workgroup Intranet Server

Part Number	Description	Quantity
8477-42Y	Netfinity 1000 (IDE) Pentium III 600 MHz/512 KB L2, 64 MB ECC, Open, 40X, PCI/ISA	1
01K1130	64 MB 100 MHz ECC SDRAM DIMM [1]	1
33L4958	10.1 GB 7200rpm EIDE HDD	1
02K3454	PCI Fast/Wide Ultra SCSI Adapter	1
01K1319	10/20 GB NS Internal SCSI Tape Drive	1
65464AN	G54 Color Monitor 15" (348-mm, 13.7" Viewable Image Size), stealth black	1
94G3135	APC Smart-UPS 1000	1

1. For a total of 128 MB of system memory.

An Intranet server is a server that handles all requests from the Intranet (internal "Internet"). Usually, this type of server has the same characteristics as a normal file

server. The main difference is that an Internet server talks a different language (TCP/IP vs. NETBEUI or IPX/SPX) and often needs to do an extra security check (firewall). In the case of an Internet server, the server itself talks mostly to just one client, the Internet Service Provider (ISP), instead of many clients like a file server does.

With this in mind, the IBM Netfinity 1000 (IDE) was selected to provide an affordable price point for the growing Internet server market with Pentium III processing, 128 MB of system memory (expandable to 768 MB), integrated 10/100 Ethernet controller, high-performance storage, and power protection with an APC Smart-UPS. The configuration includes a tape backup unit for secure backup of critical data in the event of a system or storage failure.

File and Print Server

Part Number	Description	Quantity
8477-42Y	Netfinity 1000 (IDE) Pentium III 600 MHz/512 KB L2, 64 MB ECC, Open, 40X, PCI/ISA	1
01K1130	64 MB 100 MHz ECC SDRAM DIMM[1]	1
02K3454	PCI Fast/Wide Ultra SCSI Adapter	1
01K1319	10/20 GB NS Internal SCSI Tape Drive	1
65464AN	G54 Color Monitor 15" (348-mm, 13.7" Viewable Image Size), stealth black	1
94G3135	APC Smart-UPS1000	1

1. For a total of 128 MB of system memory.

A small business or departmental server is usually required to perform all typical server functions while servicing up to 50 users in a normal workgroup computing environment, but doesn't require the high-end performance and fault tolerance properties of larger servers.

The sample configuration above consists of an IBM Netfinity 1000 (IDE) with 128 MB of memory and 9.1 GB of hard disk space. It has enough processor power and memory to run most current network operating systems comfortably and enough hard disk drive space to store a significant amount of data with additional internal storage expansion still available. Demanding network traffic is effectively handled by the standard 100 Mbps Ethernet connection. This configuration also includes a tape backup unit, monitor, and a UPS to keep the system protected from power surges and outages.

IBM Netfinity 3000 Configurator

Part Number	Processor Speed (MHz)	Number of Processors (Std/Max)	L2 ECC Cache. (KB)	Memory (Std/Max) (R=RDIMM)	Form Factor	Power Supply Quantity (Std/Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std/Max)	CD-ROM (IDE)	Bays: (Total/Avail)	Slots (Total/Avail)
8476-80U	650[4]	1/1	256	64/768 MB	Tower	1/1	-	-	-	10/100	U2	4/2	0/145.6 GB	40X-17X[1]	6/4	6/5
8476-81U	650[4]	1/1	256	128/768 MB	Tower	1/1	-	-	-	10/100	U2	4/2	9.1/145.6 GB[2]	40X-17X[1]	6/3	6/5
8476-90U	700[4]	1/1	256	64/768 MB	Tower	1/1	-	-	-	10/100	U2	4/2	0/145.6 GB	40X-17X[1]	6/4	6/5
8476-91U	700[4]	1/1	256	128/768 MB	Tower	1/1	-	-	-	10/100	U2	4/2	9.1/145.6 GB[2]	40X-17X[1]	6/3	6/5

1. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
2. Standard Hard Disk Drives (HDD) are 7200 RPM. Maximum internal capacities assume replacement of standard hard disk drives with the largest supported IBM hard disk drives.
3. Intel Pentium III processor.
4. Intel Pentium III processor with advanced transfer (full speed) L2 cache..

Netfinity 3000 Processor Upgrades

Part Number	Processor Upgrades with 512 KB Cache	Processor Speed Upgrade[1]
36L9673	Netfinity 500 MHz/512 KB Upgrade with Pentium III Processor	All 1...4xU
33L5112	Netfinity 550 MHz/512 KB Upgrade with Pentium III Processor	All 1...5xU
33L5106	Netfinity 600 MHz/512 KB Upgrade with Pentium III Processor	All 1...6xU
10K2165	Netfinity 700 MHz/256 KB Upgrade with Pentium III Processor[2]	All 8xU

1.Requires removal of the standard processor. A maximum of one processor may be installed. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine type "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".
2. Cannot be used to upgrade models 8476 1xU through 7xU.

Netfinity 3000 Memory

DIMM Socket
DIMM Socket
DIMM Socket

Part Number	Memory Description
01K1133	32 MB 100 MHz ECC SDRAM DIMM
01K1130	64 MB 100 MHz ECC SDRAM DIMM
01K1131	128 MB 100 MHz ECC SDRAM DIMM
01K1132	256 MB 100 MHz ECC SDRAM RDIMM[1]

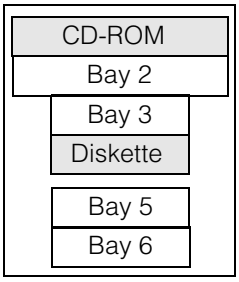
1. 01K1132 is a registered DIMM and is not compatible with 01K1130, 01K1131, or 01K1133. Installation of this RDIMM requires replacement of the standard DIMM.

Total Memory	64 MB Models	128 MB Models
64 MB	64 MB DIMM standard	-
128 MB	1 x 01K1130	128 MB DIMM standard
192 MB	1 x 01K1131	1 x 01K1130
256 MB	1 x 01K1131, 1 x 01K1130	1 x 01K1131
320 MB	2 x 01K1131	1 x 01K1131, 1 x 01K1130
384 MB	3 x 01K1131[1]	2 x 01K1131
512 MB	2 x 01K1132[1]	2 x 01K1132[1]
768 MB (max)	3 x 01K1132[1]	3 x 01K1132[1]

This table does not represent all possible memory configurations.

1. Replace standard DIMM.

Netfinity 3000 Hard Disk Drive (HDD) Storage



Open Bay Examples[2]

Total Internal Storage[1]	7200RPM Hard Disk Drives (HDDs)		
	9.1 GB (P/N 20L0553 or P/N 00N8204)	18.2 GB (P/N 20L0554 or P/N 00N8205)	36.4 GB (P/N 00N8206)
9.1 GB	1- P/N 20L0553 Std. on models x1U	-	-
18.2 GB	2	1	-
27.3 GB	3	-	-
36.4 GB	4	2	1
45.5 GB	-	-	-
54.6 GB	-	3	-
72.8 GB	-	4	2
91 GB	-	-	-
109.2 GB	-	-	3
145.6 GB (max)	-	-	4

This table does not represent all possible hard drive configurations.
1. Total Internal Storage listed is within +/- 0.2 GB unless otherwise noted.
2. Select a total storage row then select the quantity of HDDs from a column corresponding to the appropriate hard disk drive. When configuring disk drive models (8476-x1U), which include a single 9.1 GB 7200 RPM HDD, use the 9.1 GB 7200 RPM column and order one less HDD than the table indicates.

Bay	Form Factor	Height	Front Access	Usage
1	133 mm (5.25")	HH	yes	IDE CD-ROM
2	133 mm (5.25")[1]	HH	yes	open
3	89 mm (3.5")	SL	yes	open
4	89mm (3.5")	SL	yes	diskette
5	89mm (3.5")	SL[2]	no	HDD on drive models
6	89 mm (3.5")	SL[2]	no	open

1. A 3.5" conversion kit is standard in Bay 2 for installation of 3.5" hard disk drives.
2. Two slim-line (SL) bays can be combined to support a single half-high (HH) device.

Part Number	Description	RPM	Height	Bays Supported	Max. Qty.
	Ultra2 Hard Disk Drives (HDD)[1]				
20L0553	9.1 GB Wide Ultra2 SCSI HDD	7200	SL	2,3,5,6	4
20L0554	18.2 GB Wide Ultra2 SCSI HDD	7200	SL	2,3,5,6	4
	Ultra160 Hard Disk Drives (HDD)[1]				
00N8204	9.1GB 7200 rpm Ultra160 SCSI HDD	7200	SL	2,3,5,6	4
00N8205	18.2GB 7200 rpm Ultra160 SCSI HDD	7200	SL	2,3,5,6	4
00N8206	36.4GB 7200 rpm Ultra160 SCSI HDD[4]	7200	SL	2,3,5,6	4

External Storage Expansion Units[2]		Form Factor
35301RU	Netfinity EXP200 Storage Expansion Unit[3]	Rack (3U)
37L5857	Netfinity EXP200 Rack-to-Tower Conversion Kit[3]	-
37L0075	Netfinity EXP200 350 W Redundant Power Supply	-

1. Netfinity 3000 models 8476 - 7xU and below contain an Ultra SCSI controller and cable which limits Ultra2 and Ultra160 HDDs to Ultra bus speeds. Netfinity 3000 models 8476-8xU and above contain an Ultra2 SCSI controller which limits Ultra160 HDDs to Ultra2 bus speeds.
2. Not supported by the onboard external SCSI port. Select an optional SCSI controller then refer to see Appendix D: Cables-Storage Units-Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
3. Netfinity EXP200 includes a single 2 M Ultra2 SCSI cable and a single hot-swap 350W power supply and power cord. Optional hot-swap Netfinity EXP200 350W Redundant Power Supply (P/N 37L0075) includes an additional power cord. To convert an EXP200 to match the system's tower form factor, Netfinity EXP200 Rack-to-Tower Conversion Kit (P/N 37L5857) is required.
4. Planned Availability of August, 2000.

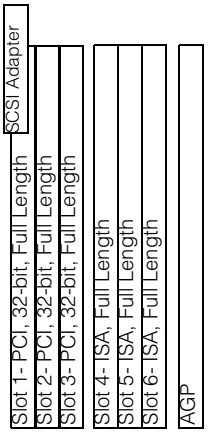
Internal SCSI Cabling

Netfinity 3000 models 8476 1xU…7xU have an IBM PCI Fast/Wide Ultra SCSI Adapter while models 8xU and up have a PCI Wide Ultra2 SCSI Adapter and support up to four internal SCSI devices through the 16-bit internal connector or 15 external SCSI devices through the 16-bit external 68-pin High Density connector; however, when internal SCSI devices are installed to the internal connector, only one SCSI device can be supported from the external connector. All models are cabled internally with a four-drop, 16-bit wide SCSI cable (models 8xU and up contain an Ultra2 SCSI cable) with a built-in active terminator at one end. The other end is attached to the internal 68-pin connector of the SCSI adapter. On the drive models, the hard disk drive (HDD) is attached to the cable connector closest to

the active terminator. On open bay models the first disk drive installed should be attached in the same manner. In the event the standard four drop cable is attached to a RAID controller and a dedicated removable media attachment to the onboard controller is required, an optional, terminated, 16-bit cable is available (Netfinity Two-Drop Internal SCSI Cable P/N 36L9636). This is not an Ultra2 cable; therefore attached devices will operate as Ultra or slower devices. If connecting narrow devices to this cable, additional 68-pin to 50-pin converters (P/N 32G3925) must be ordered. Some narrow devices include a converter in their ship group.

Netfinity 3000 I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported
	Storage Controllers[1]			
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter[2]	Full	32/64-bit	3
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	1, 2, 3
19K4646	PCI Wide Ultra160 SCSI Adapter[9]	Half	32/64-bit	1, 2, 3
	Networking[3]			
	Ethernet			
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1, 2, 3
09N9901	10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1, 2, 3
34L0301	Netfinity Gigabit Ethernet SX Adapter	Half	32/64-bit	1, 2, 3
	Token Ring			
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN[4]	Half	32-bit	1, 2, 3
34L5001	16/4 Token-Ring PCI Management Adapter	Half	32-bit	1, 2, 3
34L5201	High-Speed 100/16/4 Token-Ring PCI Management Adapter	Half	32-bit	1, 2, 3
	Communications			
33L4618	PCI V.90 56 Data/Fax Modem[5]	Half	32-bit	1, 2, 3
37L14xx	Serial I/O SST 8, 16 and 128 Port Adapters[6]	Half	32-bit	1, 2, 3
	Systems Management[7]			
94G7578	PC Server Advanced Systems Management Adapter	Full	ISA	4, 5, 6
94G5571	Advanced Systems Management Power Unit[8]	-	-	-


SCSI Adapter
Slot 1- PCI, 32-bit, Full Length
Slot 2- PCI, 32-bit, Full Length
Slot 3- PCI, 32-bit, Full Length
Slot 4- ISA, Full Length
Slot 5- ISA, Full Length
Slot 6- ISA, Full Length
AGP

1. Netfinity 3000 models 8476 1xU…7xU include a single PCI Fast/Wide Ultra SCSI Adapter while models 8xU and up include a PCI Wide Ultra2 SCSI Adapter.
2. Netfinity ServeRAID-3HB Ultra2 SCSI Adapter (P/N 37L6086) provides one internal and 2 external (0.8mm VHDCI) LVDS SCSI channels. The internal channel can be configured for external usage (0.8mm VHDCI) providing a total of 3 external LVDS SCSI channels. Includes 32 MB of mirrored battery-backup cache which helps protect against data loss in write-back cache mode in the event of a power outage or adapter maintenance.
3. Netfinity 3000 has an integrated 10/100 PCI Ethernet Controller.
4. The Wake on LAN function of this option is not supported by Netfinity Servers.
5. Due to homologation variances, modem availability may differ by country.
6. See Appendix E for details on Serial I/O options and configuration limitations.
7. Netfinity 3000 provides the following integrated system management features - Vital Product Data (VPD) plus thermal, voltage and fan sensors. For additional functions, optional PC Server Advanced Systems Management Adapter (P/N 94G7578) may be utilized. To enable the adapter's Automated Restart and Alerting as well as Remote Power On/Off features, Advanced Systems Management Power Unit (P/N 94G5571) is required.
8. Provides continuous power to the PC Server Advanced Systems Management Adapter (P/N 94G7578) even when the system is powered off.
9. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilized.

Netfinity 3000 Power, Monitor & Accessories

Part Number	Description
	Power[1]
	Uninterruptible Power Supply (UPS)[2]
94G3134	APC Smart-UPS 700
94G3135	APC Smart-UPS 1000
	Monitors
633347N	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black
6331B2N	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black
6332J1N	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black
66274AN	G78 Color Monitor 17" (406.4-mm, 16.0" Viewable Image Size), stealth black
9511AG1	T54A TFT LCD Color Monitor(306-mm x 230-mm, 15.0" Viewable), stealth black

1. Netfinity 1000 includes a 330 W voltage sensing power supply.
2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.

Netfinity 3000 Tape Options

Part Number	Description	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures[1]
09N4041	12/24GB DDS/3 4-mm Internal SCSI Tape Drive[2, 4]	2	8	89 mm (3.5") HH or 133 mm (5.25") HH	Y	Y	3510020
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive, 4[3, 5]	2	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	Y	N/A	3510020
09N4042	10/20 GB NS Internal SCSI Tape Drive[2, 4]	2, 3	8	89 mm (3.5") SL or 133 mm (5.25") HH	Y	Y	3510020
09N4040	20/40 GB DLT Internal SCSI Tape Drive	N/A	8	133 mm (5.25") FH	N	Y	3503B0X[9]
	External Tape Enclosures						
3510020	External Half High SCSI Storage Enclosure[6]	-	8/16	Desktop	N	N	-
3503B0X	DLT External SCSI Enclosure[7]	-	16	Desktop	N	N	-
	Associated Options						
10K2340	Media Bay Tray and LVD Cable Kit[8]	-	16 LVD/SE	Internal	Y	N	3551001
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	External	Y	N	3510020, 3503B0X

Note: Models 8476-80U and above include an Ultra2 SCSI controller with a four-drop multi-mode terminated LVD SCSI cable. Single-Ended devices attached to this cable will limit the entire SCSI bus to single-ended performance. Models 8476-71U and below include an Ultra SCSI controller with a four-drop,16-bit single-ended terminated SCSI cable. Support of LVD devices attached to this cable limits the LVD device to a maximum of Ultra SCSI bus speeds. All tape drives and external tape enclosures are supported by PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which includes a five-drop multi-mode LVD SCSI cable and an external 0.8-mm VHDCI connector.

1. To determine external cable requirements, note the tape drive's SCSI interface, the appropriate SCSI controller from the system configurator section, and the desired enclosure, and then refer to Appendix D: Cables - Storage Units - Controllers.
2. This single-ended device will limit the SCSI bus of models 8476-80U and above to Ultra SCSI speeds. To provide a dedicated tape SCSI bus, install PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which includes a five-drop multi-mode LVD SCSI cable.
3. Models 8476-71U and below will support LVD tape drives attached to the standard cable, however, bus speeds will be restricted to Ultra SCSI or below. For LVD support, optional PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) may be installed (includes required terminated LVD cable).
4. RAID configurations where the standard SCSI cable where the standard SCSI cable is attached to a RAID adapter require the two-drop multi-mode terminated LVD SCSI cable included with Media BayTray and LVD Cable Kit (P/N 10K2340) for attachment of the tape drive to the standard controller.
5. RAID configurations where the standard SCSI cable is attached to a RAID adapter require the two-drop multi-mode terminated LVD SCSI cable included with Media BayTray and LVD Cable Kit (P/N 10K2340) for attachment of the tape drive to the standard controller. For LVD support, optional PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) may be installed (includes required terminated LVD cable).
6. Provides a black desktop 133-mm (5.25") half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
7. Provides a black desktop DLT tape enclosure with a 68-pin high density external connector. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
8. Media Bay Tray and LVD Cable Kit (P/N 10K2340) includes an internal two-drop multi-mode terminated LVD SCSI cable.
9. Requires 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).

NOTE: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.

Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

Workgroup Intranet Server

Part Number	Description	Quantity
8476-91U	Netfinity 3000 Pentium III 700 MHz/256 KB L2, 128 MB ECC, 9.1 GB, 40X, PCI/ISA	1
20L0553	9.1 GB Wide Ultra2 SCSI HDD	2
09N4042	10/20 GB NS Internal SCSI Tape Drive	1
6331B2N	E54 Color Monitor 15" (350 mm, 13.8" Viewable Image Size), stealth black	1
94G3135	APC Smart-UPS 1000	1

An Internet server is a server that handles all requests from the Internet (Intranet or Extranet). Usually, this type of server has the same characteristics as a normal file server. The main difference is that an Internet server talks a different language (TCP/IP vs. NETBEUI or IPX/SPX) and often needs to do an extra security check (Firewall). In the case of an Internet server, the server itself talks mostly to just one client, the Internet Service Provider (ISP), instead of many clients like a file server does.

With this in mind, the IBM Netfinity 3000 was selected to provide an affordable price point for the growing Internet server market with Pentium III processing, 128 MB of system memory (expandable to 768 MB), integrated 10/100 Ethernet controller, and high-performance storage, and power protection with an APC Smart-UPS. The configuration includes a tape backup unit for secure backup of critical data in the event of a system or storage failure.

File and Print Server

Part Number	Description	Quantity
8476-81U	Netfinity 3000 Pentium III 650 MHz/256 KB L2, 128 MB ECC, 9.1 GB, 40X, PCI/ISA	1
20L0553	9.1 GB Wide Ultra2 SCSI HDD	1
09N4042	10/20 GB NS Internal SCSI Tape Drive	1
6331B2N	E54 Color Monitor 15" (350 mm, 13.8" Viewable Image Size), stealth black	1
94G3134	APC Smart-UPS 700	1

A small business or departmental server is usually required to perform all typical server functions while servicing up to 50 users in a normal workgroup computing environment, but doesn't require the high-end performance and fault tolerance properties of larger servers. The sample configuration above consists of an IBM Netfinity 3000 with 128 MB of memory and 9.1 GB of hard disk space. It has enough processor power and memory to run most current network operating systems comfortably and enough hard disk drive space to store a significant amount of data with additional internal storage expansion still available. Demanding network traffic is effectively handled by the standard 100 Mbps Ethernet connection. This configuration also includes a tape backup unit, monitor, and a UPS to keep the system protected from power surges and outages.

IBM Netfinity 3500 M20 Configurator

Part Number	Processor Speed (MHz)[2]	Number of Processors (Std./Max)	L2 ECC Cache (KB)	Memory (Std./Max) (R = RDIMM)	Form Factor	Power Supply Quantity (Std./Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std./Max)	CD-ROM (IDE)[1]	Bays: (Total/Avail)	Slots: (Total/Avail)
8657-21Y	667	1/2	256	128MB/2GB	Tower	1/1	-	-	-	10/100	U160	4/2	0/145.6GB	40X- 17X	7/5	5/5
8657-22Y	667	1/2	256	128MB/2GB	Tower	1/1	-	-	-	10/100	U160	4/2	9.1/145.6GB[3]	40X- 17X	7/4	5/5
8657-31Y	733	1/2	256	128MB/2GB	Tower	1/1	-	-	-	10/100	U160	4/2	0/145.6GB	40X- 17X	7/5	5/5
8657-32Y	733	1/2	256	128MB/2GB	Tower	1/1	-	-	-	10/100	U160	4/2	9.1/145.6GB[3]	40X- 17X	7/4	5/5
8657-41Y	800	1/2	256	128MB/2GB	Tower	1/1	-	-	-	10/100	U160	4/2	0/145.6GB	40X- 17X	7/5	5/5
8657-42Y	800	1/2	256	128MB/2GB	Tower	1/1	-	-	-	10/100	U160	4/2	9.1/145.6GB[3]	40X- 17X	7/4	5/5

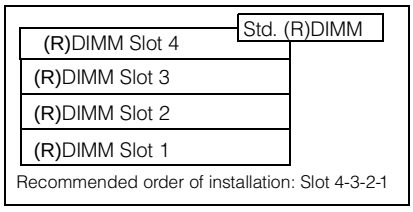
1. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
2. Intel Pentium III processor with 133 MHz front-side bus (FSB).
3. Standard Hard Disk Drives (HDD) are Ultra2 7200 RPM. Maximum internal capacities assume replacement of standard hard disk drives with the largest supported IBM hard disk drives.

Netfinity 3500 M20 Processor Upgrades

Part Number	Processor Upgrades with Full Speed Cache	SMP Support[1]	Processor Speed Upgrade[2]
10K3804	Netfinity 667 MHz/256 KB Upgrade with 133 MHz FSB Pentium III Processor	2xY	-
10K3805	Netfinity 733 MHz/256 KB Upgrade with 133 MHz FSB Pentium III Processor	3xY	2xY
10K3817	Netfinity 800 MHz/256 KB Upgrade with 133 MHz FSB Pentium III Processor	4xY	All 2…3xY

1. One additional processor may be installed, providing a maximum of two. All processors must be identical in type, speed, and cache size.
2. Requires removal of the standard processor. A maximum of two processors may be installed. All processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".

Netfinity 3500 M20 Memory



Part Number	Memory Description[1]
33L3123	128 MB 133 MHz SDRAM ECC RDIMM II
33L3125	256 MB 133 MHz SDRAM ECC RDIMM II
33L3127	512 MB 133 MHz SDRAM ECC RDIMM II

1. The recommended order of installation is in declining sequence from Slot 4 to Slot 1. Memory size is not a factor.

Total Memory[1]	Quantity of RDIMMs Added		
128 MB (1 x 128) Models	128 MB (33L3123)	256 MB (33L3125)	512 MB (33L3127)
256 MB	1	-	-
384 MB	2 or	1	-
512 MB	3	-	-
640 MB	-	2 or	1
896	-	3	-
1152 MB	-	-	2
1664 MB	-	-	3
2048 MB	-	-	4[2]

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller RDIMMs may provide a more cost-effective alternative to using larger RDIMMs.

1. Network Operating Systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. Requires removal of standard memory.

Netfinity 3500 M20 Hard Disk Drive (HDD) Storage

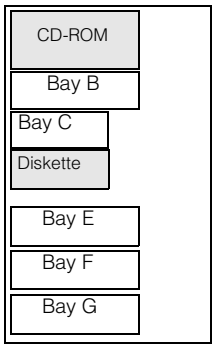
Open Bay Examples[2]						
Total Int. Storage[1]	**7200RPM Hard Disk Drives (HDDs)**			**10,000RPM Hard Disk Drives (HDDs)**		
	9.1 GB (P/N 20L0553 or P/N 00N8204)	**18.2 GB (P/N 20L0554 or P/N 00N8205)**	**36.4 GB (P/N 00N8206)**	**9.1 GB (P/N 00N8071 or P/N 00N8207)**	**18.2 GB (P/N 00N8072 or P/N 00N8208)**	**36.4 GB (P/N 00N8209)**
9.1 GB	1- P/N 20L0553 Std. on models x2Y	-	-	1	-	-
18.2 GB	2	1	-	2	1	-
27.3 GB	3	-	-	3	-	-
36.4 GB	4	2	1	4	2	1
45.5 GB	-	-	-	-	-	-
54.6 GB	-	3	-	-	3	-
72.8 GB	-	4	2	-	4	2
91 GB	-	-	-	-	-	-
109.2 GB	-	-	3	-	-	3
145.6 GB (max)	-	-	4	-	-	4

This table does not represent all possible hard drive configurations.
1. Total Internal Storage listed is within +/- 0.2 GB unless otherwise noted.
2. Select a total storage row and then select the quantity of HDDs from a column corresponding to the appropriate hard disk drive. When configuring disk drive models (8657-x2Y), which include a single 9.1 GB 7200 RPM HDD, use the 9.1 GB 7200 RPM column and order one less HDD than the table indicates.

Bay	Form Factor	Height	Front Access	Usage
A	133 mm (5.25")	HH	Yes	IDE CD-ROM
B[1]	133 mm (5.25")	HH	Yes	Open
C	89 mm (3.5")	SL	Yes	Open
D	89 mm (3.5")	SL	Yes	Diskette
E…F	89 mm (3.5")	SL	No	Open
G	89 mm (3.5")	SL	No	HDD on Drive Models

1. This bay does not support the installation of hard disk drives.

Part Number	Description	RPM	Height	Bays Supported	Max. Qty.
Ultra2 Hard Disk Drives (HDD)					
20L0553	9.1 GB Wide Ultra2 SCSI HDD	7200	SL	C,E,F,G	4
20L0554	18.2 GB Wide Ultra2 SCSI HDD	7200	SL	C,E,F,G	4
Ultra160 Hard Disk Drives (HDD)					
00N8204	9.1GB 7200 rpm Ultra160 SCSI HDD	7200	SL	C,E,F,G	4
00N8205	18.2GB 7200 rpm Ultra160 SCSI HDD	7200	SL	C,E,F,G	4
00N8206	36.4GB 7200 rpm Ultra160 SCSI HDD	7200	SL	C,E,F,G	4
00N8207	9.1GB 10000 rpm Ultra160 SCSI HDD	10000	SL	C,E,F,G	4
00N8208	18.2GB 10000 rpm Ultra160 SCSI HDD	10000	SL	C,E,F,G	4
00N8209	36.4GB 10000 rpm Ultra160 SCSI HDD	10000	SL	C,E,F,G	4
External Storage Expansion Units[1]		**Form Factor**			
35301RU	Netfinity EXP200 Storage Expansion Unit[2]	Rack (3U)			



37L5857	Netfinity EXP200 Rack-to-Tower Conversion Kit	-
37L0075	Netfinity EXP200 350 W Redundant Power Supply	-
35311RU	EXP300 Storage Expansion Unit[3]	Rack (3U)
09N7296	EXP300 Rack-to-Tower Conversion Kit	-

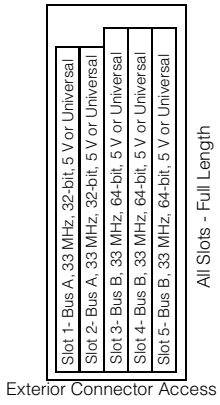
1. No external SCSI port is available. Select an optional SCSI controller then refer to Appendix D: Cables-Storage Units-Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
2. Netfinity EXP200 includes a single 2 M Ultra2 SCSI cable and a single hot-swap 350W power supply and power cord. Optional hot-swap Netfinity EXP200 350W Redundant Power Supply (P/N 37L0075) includes an additional power cord. To convert an EXP200 to match the system's tower form factor, Netfinity EXP200 Rack-to-Tower Conversion Kit (P/N 37L5857) is required.
3. Netfinity EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500W redundant power supplies, each with its own power cord. To convert an EXP300 to match the system's tower form factor, EXP300 Rack-to-Tower Conversion Kit (P/N 09N7296) is required.

Netfinity 3500 M20 Internal SCSI Cabling

Netfinity 3500 M20 systems are cabled internally with a five-drop, 16-bit wide LVD SCSI cable with a built-in active terminator at one end of the cable. The other end of the cable is attached to the internal connector of the integrated Wide Ultra160 SCSI controller. For RAID configurations, the cable can be moved from the onboard to the optional RAID controller. A tape drive can then be cabled directly to the onboard or other supported adapter with the terminated, two-drop, 16-bit, LVD SCSI cable available in the Netfinity Media Bay Conversion Kit (P/N 10K2340). No external SCSI port is included.

Netfinity 3500 M20 I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported
	Storage Controllers[1]			
19K0564	Netfinity ServeRAID-3L Ultra2 SCSI Adapter II[2]	Full	32-bit	1…5
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter[3]	Full	32/64-bit	1…5
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	1…5
37L6091	ServeRAID-4L Ultra160 SCSI Controller[4]	Full	32/64-bit	1…5[6]
37L6080	ServeRAID-4M Ultra160 SCSI Controller[5]	Full	32/64-bit	1…5[6]
19K4646	PCI Wide Ultra160 SCSI Adapter[10]	Half	32/64-bit	1…5
	Networking[7]			
	Ethernet			
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1…5
09N9901	10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1…5
34L0301	Netfinity Gigabit Ethernet SX Adapter	Half	32/64-bit	1…5
	Token Ring			
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN	Half	32-bit	1,,,5
	Communications[8]			
33L4618	PCI V.90 56K Data/Fax Modem[9]	Half	32-bit	1…5


Slot 1- Bus A, 33 MHz, 32-bit, 5 V or Universal
Slot 2- Bus A, 33 MHz, 32-bit, 5 V or Universal
Slot 3- Bus B, 33 MHz, 64-bit, 5 V or Universal
Slot 4- Bus B, 33 MHz, 64-bit, 5 V or Universal
Slot 5- Bus B, 33 MHz, 64-bit, 5 V or Universal
All Slots - Full Length
Exterior Connector Access

1. Netfinity 3500 M20 includes a single channel Ultra160 SCSI controller for internal use only. No standard external port is available. See "Internal SCSI Cabling" for cabling alternatives.
2. Netfinity ServeRAID-3L Ultra2 SCSI Adapter II (P/N 19K0564) provides either one internal or one external (0.8-mm VHDCI) LVDS SCSI channel.
3. Netfinity ServeRAID-3HB Ultra2 SCSI Adapter (P/N 37L6086) provides one internal and 2 external (0.8-mm VHDCI) LVDS SCSI channels. The internal channel can be configured for external usage (0.8-mm VHDCI connector) providing a total of 3 external LVDS SCSI channels. Includes 32 MB of mirrored battery-backup cache which helps protect against data loss in write-back cache mode in the event of a power outage or adapter maintenance.
4. ServeRAID-4L Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8-mm VHDCI.
5. ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two internal and two external Ultra160 connectors (only two connectors may be utilized). External connectors are 0.8-mm VHDCI.
6. ServeRAID-4L (P/N 37L6091) and -4M (P/N37L6080) are not supported in slots 1 or 2 if more than one RAID adapter is to be installed or more than one logical drive is to be attached to the adapter.
7. Netfinity 3500 M20 includes a full-duplex, 10/100 Mbps Ethernet PCI controller.
8. Netfinity 3500 M20 includes two USB ports, one serial and one parallel port.
9. Due to homologation variances, modem availability may differ by country.
10. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilized.

Netfinity 3500 M20 Power, Monitor & Accessories

Part Number	Description
Power[1]	
Uninterruptible Power Supply (UPS)[2]	
94G3134	APC Smart-UPS 700
94G3135	APC Smart-UPS 1000
94G3136	APC Smart-UPS 1400
Monitors[3]	
633347N	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black
6331B2N	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black
6332J1N	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black
66274AN	G78 Color Monitor 17" (406.4-mm, 16.0" Viewable Image Size), stealth black
9511AG1	T54A TFT LCD Color Monitor(306-mm x 230-mm, 15.0" Viewable), stealth black
Keyboard and Mouse[4]	
28L3644	Space Saver II Keyboard[5]
28L3673	Sleek 2-Button Stealth Black Mouse

1. Netfinity 3500 M20 includes a 330 W voltage sensing power supply and a single line cord.
2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
3. Netfinity 3500 M20 uses an SVGA controller (S3 Savage4 chipset) with 8 MB of video memory.
4. Netfinity 3500 M20 includes both a keyboard and mouse.
5. Advanced TrackPoint IV features are not available on IBM Netfinity systems.

Netfinity 3500 M20 Tape Options

Part Number	Description	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures[1]
09N4041	12/24GB DDS/3 4-mm Internal SCSI Tape Drive[2, 3]	B	8	89 mm (3.5") HH or 133 mm (5.25") HH	Y	Y	3510020
09N4042	10/20GB NS Internal SCSI Tape Drive[2, 3]	B, C	8	89 mm (3.5") SL or 133 mm (5.25") HH	Y	Y	3510020
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive[4]	B	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	Y	N/A	3510020
	External Tape Enclosures						
3510020	External Half High SCSI Storage Enclosure[5]	-	8/16	Desktop	N	N	-
	Associated Options						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	External	Y	N	3510020, 3503B0X
10K2340	Media Bay Tray and LVD Cable Kit[6]	-	16 LVD	Internal	Y	N	3551001

Note:All models include an Ultra160 SCSI controller with a five-drop multi-mode terminated LVD SCSI cable. Single-Ended devices attached to this cable will limit the entire SCSI bus to single- ended performance. All tape drives and external tape enclosures are supported by PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which includes a five-drop multi-mode terminated LVD SCSI cable and an external 0.8-mm VHDCI connector.

1. To determine cable requirements, note the tape drive's SCSI interface, the appropriate SCSI controller from the system configurator section, and the desired enclosure, then refer to Appendix D: Cables - Storage Units - Controllers.
2.This single-ended device will limit the SCSI bus to which it is attached to Ultra SCSI speeds. To provide a dedicated tape SCSI bus, install PCI Wide ultra160 SCSI Adapter (P/N 19K4646) which includes a five-drop multi-mode LVD SCSI cable.
3. RAID configurations where the standard SCSI cable is attached to a RAID adapter, require the two-drop multi-mode terminated LVD SCSI cable included with Media Bay Tray and LVD Cable Kit (P/N 10K2340) for attachment of the tape drive to the standard SCSI controller.
4.RAID configurations where the standard SCSI cable is attached to a RAID adapter, require the two-drop multi-mode terminated LVD SCSI cable included with Media Bay Tray and LVD Cable Kit (P/N 10K2340) for attachment of the tape drive to the standard SCSI controller. For LVD support, optional PCI Wide Ultra160 SCSI Adapter (P/N 19K4646), which includes a five-drop multi-mode terminated LVD SCSI cable, may be installed.
5. Provides a black desktop 133 mm (5.25") half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
6. Media Bay Tray and LVD Cable Kit (P/N 10K2340) includes an internal two-drop multi-mode terminated LVD SCSI cable.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes

Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

Internet Server

Part Number	Description	Quantity
8657-32Y	Netfinity 3500 M20 (Pentium III 733 MHz/128 MB/9.1 GB)	1
33L3123	128 MB 133 MHz SDRAM ECC RDIMM II[1]	1
20L0553	9.1 GB Wide Ultra2 SCSI HDD[2]	2
09N4042	10/20 GB NS Internal SCSI Tape Drive	1
6331B2N	E54 Color Monitor 15" (350 mm, 13.8" Viewable Image Size), stealth black	1
94G3134	APC Smart-UPS 700	1

1. For a total of 256 MB of system memory.
2. For a total of 27.3 GB of internal storage.

An Internet server is a server that handles all requests from the Internet (Intranet or Extranet). Usually, this type of server has the same characteristics as a normal file server. The main difference is that an internet server talks a different language (TCP/IP vs. NETBEUI or IPX/SPX) and often needs to do an extra security check (firewall). In the case of an Internet server, the server itself talks mostly to just one client, the Internet Service Provider (ISP), instead of many clients like a file server does.

With this is mind, the IBM Netfinity 3500 M20 was selected to provide an affordable price point for the growing Internet server market with two-way Pentium III processing, 256 MB of system memory (expandable to 1 GB), and power protection with an APC Smart-UPS.

The network configuration depends on the method that will be used to connect the server to the Internet. Usually fast Ethernet routers are used, but if other methods are used you can add the appropriate adapter. The configuration includes a tape backup unit for secure backup of critical data in the event of a system or storage failure.

File and Print Server

Part Number	Description	Quantity
8657-21Y	Netfinity 3500 M20 (Pentium III 667/128 MB/0 GB)	1
33L3123	128 MB 133 MHz SDRAM ECC RDIMM II[1]	1
00N8072	18.2 GB 10,000 RPM Ultra 160 SCSI HDD[2]	3
00N7991	20/40GB DDS/4 4-mm Internal Tape Drive	1
65464AN	G54 Color Monitor 15" (348 mm, 13.7" Viewable Image Size), stealth black	1
94G3134	APC Smart-UPS 700	1

1. For a total of 256 MB of system memory.
2. For a total of 54.6 GB of internal storage.

A small business or departmental server is usually required to perform all typical server functions while servicing up to 100 users in a normal workgroup computing environment, but doesn't require the high-end performance and fault-tolerance properties of larger servers.

The sample configuration above consists of an IBM Netfinity 3500 M20 with 256 MB of memory and 54.6 GB of hard disk space. It has enough processor power and memory to run most current network operating systems comfortably and enough hard disk drive space to store a significant amount of data with additional external storage expansion still available. Demanding network traffic is effectively handled by the standard 100 Mbps Ethernet connection.

This configuration also includes a tape backup unit, monitor, and a UPS to keep the system protected during power surges and outages.

Application Server

Part Number	Description	Quantity
8657-41Y	Netfinity 3500 M20 (Pentium III 800 MHz/128 MB/0 GB)	1
10K3817	Netfinity 800 MHz/256 KB Upgrade with 133 MHz FSB Pentium III Processor	1
33L3125	256 MB 133 MHz SDRAM ECC RDIMM II[1]	1
37L6091	ServeRAID-4L Ultra160 SCSI Controller	1
10K2340	Media Bay Tray and LVD Cable Kit[2]	1
00N8071	9.1 GB 10,000 RPM Ultra160 SCSI HDD[3]	3
09N4042	10/20 GB NS Internal SCSI Tape Drive	1

6331B2N	E54 Color Monitor 15" (350 mm, 13.8" Viewable Image Size), stealth black	1
94G3134	APC Smart-UPS 700	1

1. For a total of 384 MB of system memory.
2. Cable for dedicated attachment of tape to standard controller.
2. For a total of 27.3 GB of internal storage.

An application server differs from a file and print server in that it has a higher workload, in providing application serving requirements for users. With this in mind, the IBM Netfinity 3500 M20 was selected to provide an affordable price point for an application server, with two-way Pentium III processing, 384 MB of system memory (expandable to 2 GB), and availability features such as RAID-protected internal storage and power protection with an APC Smart-UPS.

IBM Netfinity 4000R Configurator

Part Number[4]	Processor Speed (MHz)	Number of Processors (Std/Max)[1]	L2 ECC Cache. (KB)	Memory (Std/Max) R=RDIMM[1]	Form Factor	Power Supply Quantity (Std/Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor	Onboard Ethernet (mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std/Max)[1]	CD-ROM (IDE)	Bays: (Total/Avail)[1]	Slots: (Total/Avail)[1]
8652/8653 51Y	650[6]	1/2	256	256MB/2GB	Rack(1U)	1/1	-	-	-	2 x10/100	U	1/0	9.1/ 36.4GB[7]	24X-10X[8]	3/1	2/1
8652/8653 61Y	650[6]	2/2	256	512MB/2GB	Rack(1U)	1/1	-	-	-	2 x10/100	U	1/0	18.2/ 36.4GB[7]	24X-10X[8]	3/0	2/1
8652-62Y[2]	650[6]	2/2	256	1GB/2GB	Rack(1U)	1/1	-	-	-	2 x10/100	U	1/0	18.2/ 36.4GB[7]	24X-10X[8]	3/0	2/1
8653-62Y[3]	650[6]	2/2	256	512MB/2GB	Rack(1U)	1/1	-	-	-	2 x10/100	R-U2	1/0	18.2/ 36.4GB[7]	24X-10X[8]	3/0	2/1
8652-63Y[2]	650[6]	2/2	256	2GB/2GB	Rack(1U)	1/1	-	-	-	2 x10/100	U	1/0	18.2/ 36.4GB[7]	24X-10X[8]	3/0	2/1
8652-64Y[2]	650[6]	2/2	256	2GB/2GB	Rack(1U)	1/1	-	-	-	2 x10/100	U	1/0	36.4/ 36.4GB[7]	24X-10X[8]	3/0	2/1
8652/8653 31Y	750[6]	1/2	256	256MB/2GB	Rack(1U)	1/1	-	-	-	2 x10/100	U	1/0	9.1/ 36.4GB[7]	24X-10X[8]	3/1	2/1
8652/8653 41Y	750[6]	2/2	256	512MB/2GB	Rack(1U)	1/1	-	-	-	2 x10/100	U	1/0	18.2/ 36.4GB[7]	24X-10X[8]	3/0	2/1
8652/8653 42Y	750[6]	2/2	256	1GB/2GB	Rack(1U)	1/1	-	-	-	2 x10/100	U	1/0	18.2/ 36.4GB[7]	24X-10X[8]	3/0	2/1
8652/8653 43Y	750[6]	2/2	256	2GB/2GB	Rack(1U)	1/1	-	-	-	2 x10/100	U	1/0	18.2/ 36.4GB[7]	24X-10X[8]	3/0	2/1
8652/8653 44Y	750[6]	2/2	256	512MB/2GB	Rack(1U)	1/1	-	-	-	2 x10/100	U	1/0	36.4/ 36.4GB[7]	24X-10X[8]	3/0	2/1
8653-45Y[3]	750[6]	2/2	256	1GB/2GB	Rack(1U)	1/1	-	-	-	2 x10/100	R-U2	1/0	18.2/ 36.4GB[7]	24X-10X[8]	3/0	2/1
8653-46Y[3]	750[6]	2/2	256	2GB/2GB	Rack(1U)	1/1	-	-	-	2 x10/100	R-U2	1/0	36.4/ 36.4GB[7]	24X-10X[8]	3/0	2/1

1. The Netfinity 4000R does not support customer installation of adapters, HDDs, memory, processors, or any other devices that must be installed inside the server. Non-standard features must be installed at the factory. Contact your IBM Marketing Representative for more information.
2. Available in the US only.
3. Not available in the US.
4. Not all models are available in all countries. Models beginning with "8652" are available in the United States only. Models beginning with "8653" are only available outside the United States and Latin America. Each Netfinity 4000R requires an available console switch port and is housed in a 19" rack mountable drawer and ships standard without a keyboard or mouse. See "Rack and NetBay" under "Netfinity 4000R Power, Monitor & Accessories" for supported IBM racks.
5. Intel Pentium III processor.
6. Intel Pentium III processor with advanced transfer (full speed) L2 cache.
7. Standard Hard Disk drives (HDD) are 7200 RPM. Maximum internal capacities assume factory replacement of standard hard disk drives with the largest supported IBM hard disk drives.
8. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
9. Requires Console Cable Set P/N 94G7447.

Netfinity 4000R Processor Upgrades

Part Number	Processor Upgrades with 512KB Cache or 256KB Advanced Transfer Cache	SMP Support
N/A[1]	Netfinity 500 MHz/512 KB Upgrade with Pentium III Processor	All 1xY[2]
N/A[1]	Netfinity 650 MHz/256 KB Upgrade with Pentium III Processor	51Y[2]
N/A[1]	Netfinity 750 MHz/256 KB Upgrade with Pentium III Processor	31Y[2]

1.The Netfinity 4000R does not support customer installation of adapters, HDDs, memory, processors, or any other devices that must be installed inside the server. Non-standard features must be installed at the factory. Contact your IBM Marketing Representative for more information.
2. One additional processor may be installed, providing a maximum of two. All processors must be identical in type, speed and cache size.

Netfinity 4000R Memory

RDIMM Socket
RDIMM Socket
RDIMM Socket
RDIMM Socket

Part Number	Memory Description
N/A[1]	128MB 100MHz ECC SDRAM RDIMM
N/A[1]	256MB 100MHz ECC SDRAM RDIMM
N/A[1]	512MB 100MHz ECC SDRAM RDIMM

1. The Netfinity 4000R does not support customer installation of adapters, HDDs, memory, processors, or any other devices that must be installed inside the server. Non-standard features must be installed at the factory. Contact your IBM Marketing Representative for more information.

Netfinity 4000R Hard Disk Drive (HDD) Storage

Bay	Form Factor	Height	Front Access	Usage
1	133 mm (5.25)	SL	yes	IDE CD-ROM
2[1]	89 mm (3.5")	SL	no	open/HDD
3[1]	89 mm (3.5")	SL	no	Std HDD

1. The Netfinity 4000R does not support customer installation of adapters, HDDs, memory, processors, or any other devices that must be installed inside the server. Non-standard features must be installed at the factory. Contact your IBM Marketing Representative for more information.

Part Number	Description	RPM	Height
Internal Hard Disk Drives (HDD)			
N/A[1]	9.1GB 7200 RPM SCSI HDD	7200	SL
N/A[1]	18.2GB 7200 RPM SCSI HDD	7200	SL

1. A maximum of two SL HDDs may be installed. The Netfinity 4000R does not support customer installation of adapters, HDDs, memory, processors, or any other devices that must be installed inside the server. Non-standard features must be installed at the factory. Contact your IBM Marketing Representative for more information.

Netfinity 4000R Internal SCSI Cabling

Netfinity 4000R models (except 8653-45Y, 46Y and 62Y) contain a single channel Wide Ultra SCSI adapter that has two 68-pin connectors to support SCSI device attachment. One connector supports 16-bit internal SCSI devices, while the other supports a 16-bit external device. Up to two Wide Ultra SCSI HDDs can be supported internally. External support is limited to one SCSI device. Models 8653-45Y, 46Y and 62Y contain a single ServeRAID-3L RAID adapter for internal use only. Non-standard features must be installed at the factory. Contact your IBM Marketing Representative for more information.

Netfinity 4000R I/O Options

Part Number	Description
Storage Controllers[2]	
N/A[1]	Netfinity ServeRAID-3L Ultra2 SCSI Adapter (i channel)
N/A[1]	PCI Fast/Wide Ultra SCSI Adapter (1 channel)
N/A[1]	Ultra SCSI Adapter (2 channel)
N/A[1]	Ultra2 SCSI Adapter (1 channel)
Networking[3]	
N/A[1]	Netfinity 10/100 Ethernet PCI Adapter 2
N/A[1]	Netfinity Gigabit Ethernet SX Adapter
N/A[1]	16/4 Token-Ring PCI Management Adapter

1. The Netfinity 4000R does not support customer installation of adapters, HDDs, memory, processors, or any other devices that must be installed inside the server. Non-standard features must be installed at the factory. Contact your IBM Marketing Representative for more information.
2. Netfinity 4000R models 8653-45Y, 46Y and 62Y contain a single channel ServeRAID-3L adapter for internal use only. Other models contain a single channel Wide Ultra SCSI adapter with an internal 68-pin connector supporting up to two internal HDDs and an external 68-pin high density connector for attachment of a single external SCSI device.
3. Netfinity 4000R contains two integrated 10/100 PCI Ethernet controllers.

Netfinity 4000R Power, Monitor & Accessories

Part Number	Description
	Power[1]
94G6667	Power Cable Type A14 (4.3m, 14 ft.)[2]
94G7448	Power Cable Type C12 (3.7m, 12 ft.)[3]
	Power Distribution Units (PDU)
94G6666	100-120V Power Distribution Unit[4]
94G7450	200-240V Power Distribution Unit[5]
	Uninterruptible Power Supply (UPS)
94G6674	APC Smart-UPS 1400RMB[6]
94G6676	APC Smart-UPS 3000RMB[7]
37L6861	APC Smart-UPS 5000RMB[15]
	Monitors[8]
633347N	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[12]
6331B2N	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[12]
6332J1N	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[12]
66274AN	G78 Color Monitor 17" (406.4-mm, 16.0" Viewable Image Size), stealth black[12]
9511AG1	T54A TFT LCD Color Monitor(306-mm x 230-mm, 15.0" Viewable), stealth black[13]
	Rack and NetBay[9]
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack[10]
9306910	Netfinity Rack (Perforated Doors)[10]
36L9703	Netfinity Rack Extension Kit
9306200	Netfinity NetBAY22[10]
36L9702	NetBAY22 Rack Extension Kit
	Keyboard and Mouse[11]
28L3644	Space Saver II Keyboard[14]
01K1260	TrackPoint IV 104-key Black Keyboard[14]
28L3621	Preferred Keyboard (stealth black)
28L3673	Sleek 2-Button Stealth Black Mouse
	Console Options[8]
94G7445	Console Server Selector Switch (8-port)
28L0542	Netfinity Console Server Selector Switch (4-port)
94G7447	NetBAY Console Cable Set - 12 ft. (3.66m)

1. Netfinity 4000R includes a single 150W power supply and a single 2.8 m (9 ft.) power cord with an IEC 320-C14 connector on the outlet end for attachment to a high voltage UPS or PDU.
2. For attachment to low voltage UPS part number 94G6674 or 94G6676, PDU part number 94G6666 or other NEMA 5-15R outlet.
3. For attachment to a high voltage UPS or PDU or other IEC 320-C13 outlet.
4. Requires optional power cord 94G6667. Contains eight NEMA 5-15R outlets and one communication link, Supports up to 12 amps.
5. Contains ten IEC 320-C13 outlets and three communication links, Supports up to 16 amps.
6. Requires optional power cord 94G6667. Height is 3U. See "Rack and NetBAY" for supported IBM racks. Contains six NEMA 5-15R outlets.
7. Requires optional power cord 94G6667. Height is 3U. See "Rack and NetBAY" for supported IBM racks. Contains eight NEMA 5-15R outlets.
8. An available port on a console switch is required for each Netfinity 4000R.
9. Netfinity 4000R is housed in a 19" rack mountable drawer and requires one of the racks listed here. See IBM Netfinity Rack Cabinet and Options section for IBM rack supported devices. To provide adequate cooling, a blank filler panel should be placed on the front of any unused rack space. If non-IBM racks are to be used, assure that both front and rear doors offer approximately 60% open area uniformly distributed and in line with installed servers. A clearance of 51 to 64-mm (2 to 2-1/2 inches) must be maintained between the front door and the system unit's front bezel. The rear door must maintain the same or greater clearance. Clearance between the EIA mounting rails and rack side covers must be less than 13-mm (1/2-inch) to prevent air re-circulation from back to front. Non-rack installations are not supported.
10. Rack Extension kits 36L9703 and 36L9702 are recommended for 93069xx and 9306200 respectively, to provide sufficient room for cable management.
11. Netfinity 4000R does not include a keyboard or mouse.
12. Installation within a rack requires optional Monitor Compartment (P/N 94G7444).
13. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit II (P/N 37L6888) and Netfinity Rack Keyboard Tray (P/N 28L4707). A space saver keyboard may coexist within the same 28L4707 keyboard tray.
14. Advanced TrackPoint IV features are not available on IBM Netfinity systems.
15. Height is 5U. See "Rack and NetBAY" for supported IBM racks

IBM Netfinity 6000R Configurator

Part Number	Processor Speed (MHz)[2]	Number of Processors (Std./Max) L2 ECC Cache (KB)	Memory (Std./Max) (R = RDIMM)	Form Factor	Power Supply Quantity (Std./Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail) Internal Hard Disk Drive (Std./Max)	CD-ROM (IDE)[5]	Bays: (Total/Avail) Slots: (Total/Avail)
8682-1RY[1]	700	1/4	1024	512MB(R)/16GB[3]	Rack(4U)	1/3	P, S, H,F	S-Fans O-Power[4]	Y	10/100	D,U160	2/0	0/218 GB	40X- 17X	8/6[6]	6/6
8682-2RY[1]	700	1/4	2048	512MB(R)/16GB[3]	Rack(4U)	1/3	P, S, H,F	S-Fans O-Power[4]	Y	10/100	D,U160	2/0	0/218 GB	40X- 17X	8/6[6]	6/6

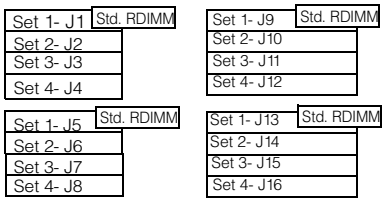
1. Housed in a 19" Rack mountable drawer and ships standard without a keyboard or mouse. See "Rack and NetBAY" under "Netfinity 6000R Power, Monitor & Accessories" for supported IBM racks.
2. Intel Pentium III Xeon processor with full speed ECC L2 cache and 100 MHz access to memory and I/O buses. IBM intends to make available a Netfinity 6000R model containing an Intel 800 MHz/2 MB L2 Cache Pentium II Xeon processor when Intel makes this processor generally available to the marketplace.
3. Advanced Chipkill ECC memory corrects two-, three-, and four-bit memory errors.
4. N+1 power supply redundancy requires a minimum of one optional 270 W Hot-Swap Redundant Power Supply (P/N 37L6880). Robust configurations may require two. See "Power" under "Netfinity 6000R Power, Monitor & Accessories" for additional information.
5. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
6. Netfinity 6000R includes three hot-swap bays. Optional Netfinity 3-Pack Ultra 160 Hot-Swap Expansion Kit (P/N 33L5050) expands the total hot-swap bays to six.

Netfinity 6000R Processor Upgrades

Part Number	Processor Upgrades with Full Speed Cache	SMP Support[1]	Processor Speed Upgrade[2]
00N7946	Netfinity 700 MHz/1 MB Upgrade with Pentium III Xeon Processor	1RY	-
00N7944	Netfinity 700 MHz/2 MB Upgrade with Pentium III Xeon Processor	2RY	1RY

1. Three additional processors may be installed, providing a maximum of four. All processors must be identical in type, speed, and cache size.Processors must be installed in numerical order from slot 1 to slot 4.
2. Requires removal of the standard processor. A maximum of four processors may be installed. All processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".

Netfinity 6000R Memory



All RDIMMs installed in each set must be the same size, but all the sets do not have to contain RDIMMs of the same size. Install RDIMM sets in numerical sequence from 1 to 4.

Total Memory[1]	Quantity of RDIMMs Added[2]			
	128 MB (33L3113)	256 MB (33L3115)	512 MB (33L3117)	1 GB (33L3119)
512 MB	4 x 128 RDIMMs standard	-	-	-
1.0 GB	4	-	-	-
1.5 GB	-	4	-	-
2.0 GB	4	4	-	-
2.5 GB	-	8	-	-
3.0 GB	4	-	4	-
4 GB	4	4	4	-
5 GB	4	-	8	-
6 GB[3]	-	8	8	-
7 GB[3]	-	4	12	-
8 GB[3]	-	-	16	-
9 GB	4	-	-	8
10 GB[3]	-	-	12	4
12 GB[3]	-	-	8	8
14 GB[3]	-	-	4	12
16 GB[3] (max)	-	-	-	16

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller RDIMMs may provide a more cost-effective alternative to using larger RDIMMs.

1. Network Operating Systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. To obtain the quantity of memory identified in the "Total Memory" column, select the appropriate row and order the quantity of RDIMMs identified in all columns for that row. Example: For 2.0 GB, order 4 x 33L3113 plus 4 x 33I3115.
3. Requires removal of standard RDIMMs.

Part Number	Memory Description[1]
33L3113	Netfinity 128 MB, 100 MHz ECC SDRAM RDIMM
33L3115	Netfinity 256 MB, 100 MHz ECC SDRAM RDIMM
33L3117	Netfinity 512 MB, 100 MHz ECC SDRAM RDIMM
33L3119	Netfinity 1 GB 100 MHz ECC SDRAM RDIMM

1. Due to four-way interleaving all RDIMMs installed in each set must be the same size, but all the sets do not have to contain RDIMMs of the same size. Install RDIMM sets in numerical sequence from 1 to 4. Chipkill support is provided on the memory card.

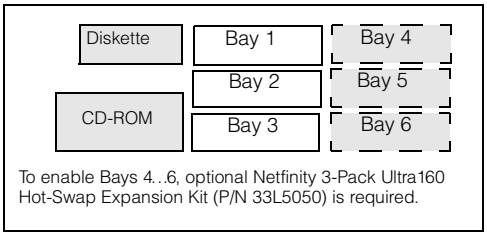
Netfinity 6000R Hard Disk Drive (HDD) Storage

Total Int. Storage[1]	7200RPM Hard Disk Drives (HDDs)			10,000RPM Hard Disk Drives (HDDs)		
	9.1 GB (P/N 36L9744 or P/N 37L7201)	18.2 GB (P/N 36L9745 or P/N 37L7202)	36.4 GB (P/N 37L7203)	9.1 GB (P/N 36L9748 or P/N 37L7204)	18.2 GB (P/N 36L9749 or P/N 37L7205)	36.4 GB (P/N 37L7206)
0 GB	Standard on Base Models			Standard on Base Models		
9.1 GB	1	-	-	1	-	-
18.2 GB	2	1	-	2	1	-
27.3 GB	3	-	-	3	-	-
36.4 GB	4[2]	2	1	4[2]	2	1
45.5 GB	5[2]	-	-	5[2]	-	-
54.6 GB	6[2]	3	-	6[2]	3	-
72.8 GB	-	4[2]	2	-	4[2]	2
91 GB	-	5[2]	-	-	5[2]	-
109.2 GB	-	6[2]	3	-	6[2]	3
145.6GB	-	-	4[2]	-	-	4[2]
182GB	-	-	5[2]	-	-	5[2]
218.4GB (max)	-	-	6[2]	-	-	6[2]

This table does not represent all possible hard drive configurations.
1. Select a total storage row and then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within +/- 0.2 GB unless otherwise noted.
2. Requires Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit (P/N 33L5050).

Bay	Form Factor	Height	Front Access	Usage
-	89 mm (3.5")	SL	Yes	Diskette
-	133 mm (5.25")	HH	Yes	IDE CD-ROM
1…3	HS	SL[1]	Yes	Open
4…6[2]	HS	SL[1]	Yes	Open

1. Half-high (HH) devices are NOT supported.
2. To enable Bays 4…6, optional Netfinity 3-Pack Utra160 Hot-Swap Expansion Kit (P/N 33L5050) is required.



To enable Bays 4…6, optional Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit (P/N 33L5050) is required.

Part Number	Description	RPM	Height	Bays Supported[2]	Max. Qty.
Ultra2 Disk Drives (HDD)					
36L9744	Netfinity 9.1 GB Wide Ultra2 SCSI Hot-Swap SL HDD	7200	SL	1…6	6[1]
36L9745	Netfinity 18.2 GB Wide Ultra2 SCSI Hot-Swap SL HDD	7200	SL	1…6	6[1]
36L9748	Netfinity 9.1 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	10,000	SL	1…6	6[1]
36L9749	Netfinity 18.2 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	10,000	SL	1…6	6[1]
Ultra160 Hard Disk Drives (HDD)					
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1…6	6[1]
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1…6	6[1]
37L7203	36.4 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1…6	6[1]
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1…6	6[1]
37L7205	8.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1…6	6[1]
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1…6	6[1]
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15000	SL	1…6	6[1]
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15000	SL	1…6	6[1]
Associated Options					
33L5050	Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit[2]	-	3 x SL	4…6	-

	External Storage Expansion Units[3]	Form Factor
35301RU	Netfinity EXP200 Storage Expansion Unit[4]	Rack (3U)
37L0075	Netfinity EXP200 350 W Redundant Power Supply	-
35311RU	EXP300 Storage Expansion Unit[5]	
35601RU	FAStT EXP500 Storage Expansion Unit[6]	Rack (3U)

1. Netfinity 6000R ships with bays 1…3 enabled. To enable installation of greater than three HDDs requires Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit (P/N 33L5050).
2. Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit (P/N 33L5050) includes a hot-swap backplane and associated components for two cabling options. Within the option are two 16-bit LVD SCSI cables. One can be attached from the 3-pack Ultra160 Hot-Swap backplane to the second connector of the dual-channel Ultra160 SCSI controller, the other, through the use of a repeater card included with the option, can be cabled directly to the standard backplane. Utilizing the second channel will eliminate the possibility of attaching external devices to that channel.
3. Not supported by the onboard external SCSI port. Select an optional SCSI controller then refer to Appendix D: Cables-Storage Units-Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
4. Netfinity EXP200 includes a single 2 M Ultra2 SCSI cable and single hot-swap 350W power supply and power cord. Optional hot-swap Netfinity EXP200 350W Redundant Power Supply (P/N 37L0075) includes an additional power cord.
5. EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500W redundant power supplies, each with its own power cord.
6. FAStT EXP500 Storage Expansion Unit (P/N 35601RU) includes dual hot-swap 350W power supplies, each with its own power cord.

Netfinity 6000R Internal SCSI Cabling

The Netfinity 6000R contains a DASD backplane supporting three hot-swap, SCA-2 compliant drive bays. The backplane is connected to one of the internal connectors of the integrated dual-channel Ultra160 SCSI controller through a 16-bit LVD SCSI cable. An optional Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit (P/N 33L5050) can be installed to provide additional internal HDD storage capacity. Within this option are two 16-bit LVD SCSI cables. One can be attached from the 3-Pack Ultra Hot-Swap backplane to the second connector of the dual-channel Ultra160 SCSI controller, the other, through the use of a repeater card included with the option, can be cabled directly to the standard backplane.

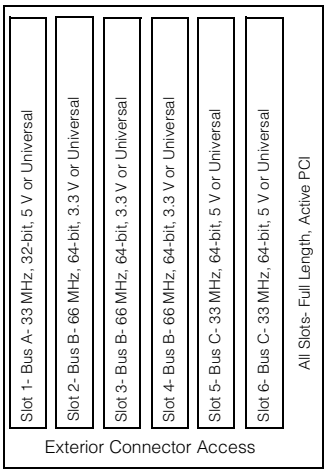
In configurations where external SCSI device attachment is required instead of additional internal HDD storage, a second 16-bit LVD SCSI cable is included with the server. One end of the cable can be attached to the second Ultra160 connector and the other is attached to the external 0.8-mm VHDCI connector on the back of the chassis. This provides an external connection to support LVDS devices.

Netfinity 6000R I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported[1]	Hot-Plug[2]	PCI Voltage Key	MHz
	Storage Controllers[3]						
19K0564	Netfinity ServeRAID-3L Ultra2 SCSI Adapter II[5]	Full	32-bit	1, 5…6	X	5	33
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter[6]	Full	32/64-bit	1, 5…6	X	5	33
37L6091	ServeRAID-4L Ultra160 SCSI Controller[7]	Full	32/64-bit	1…6[4]	X	Universal	33
37L6080	ServeRAID-4M Ultra160 SCSI Controller[8]	Full	32/64-bit	1…6[4]	X	Universal	33
37L6889	ServeRAID-4H Ultra160 SCSI Controller[9]	Full	32/64-bit	1…6[4]	X	Universal	33
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	1, 5…6	-	5	33
19K4646	PCI Wide Ultra160 SCSI Adapter[10]	Half	32/64-bit	1…6	-	Universal	66
	Fiber Storage Controllers and Options[11]						
35261RU	Netfinity Fibre Channel RAID Controller Unit	-	-	-	-	-	-
01K7296	Netfinity Fibre Channel Failsafe RAID Controller	-	-	-	-	-	-
00N6881	Netfinity FAStT Host Adapter	Half	32/64-bit	1…6	X	Universal	66
35521RU	FAStT500 Storage Server	-	-	-	-	-	-
35421RU	FAStT200 Storage Server	-	-	-	-	-	-
35422RU	FAStT200 HA Storage Server	-	-	-	-	-	-
19K1121	FAStT200 Redundant RAID Controller	-	-	-	-	-	-
2108R3S	SAN Data Gateway Router (Single-Ended)	-	-	-	-	-	-
2108R3D	SAN Data Gateway Router (Differential)	-	-	-	-	-	-
2109S08	SAN Fibre Channel Switch, 8-Port	-	-	-	-	-	-
2109S16	SAN Fibre Channel Switch, 16-Port	-	-	-	-	-	-
	Networking[12]						
	Ethernet						
09N9901	Netfinity 10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1…6[4]	X	Universal	33
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1…6[4]	X	Universal	33
34L0301	Netfinity Gigabit Ethernet SX Adapter	Half	32/64-bit	1…6[4]	X	Universal	33
	Token Ring						
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN[14]	Half	32-bit	1…6[4]	X	Universal	33
	Communications[15]						
33L4618	PCI V.90 56 Data/Fax Modem[16]	Half	32-bit	1, 5…6	-	5	33
37L14xx	Serial I/O SST 8, 16, and 128 port adapters[17]	Half	32-bit	1, 5…6[17]	-	5	33
	Systems Management[18]						
01K7209	Netfinity Advanced System Management PCI Adapter[19]	Full	32-bit	1, 5…6[20]	-	5	33
03K9309	Netfinity Advanced System Management Interconnect Cable Kit[21]	-	-	-	-	-	-
36L9654	Netfinity Advanced System Management Token-RIng Connection[22]	-	-	-	-	-	-

1.The 5 V - 33 MHz slots support Universal or 5 V adapters. A universal voltage-66 MHz adapter plugged into these slots will operate at 33 MHz.The 3.3 V slots support universal or 3.3 V adapters. A universal voltage-33 MHz adapter plugged into these slots limits a 66 MHz PCI adapter installed on the same bus to 33 MHz.
2. All 6 slots are full length hot-plug capable using IBM's Active PCI technology. For Network Operating System support access URL www.ibm.com/pc/us/compat
3. Netfinity 6000R includes a dual-port, dual-channel Ultra160 SCSI controller. See "Internal SCSI Cabling" for cabling alternatives.
4. Installation of a 33 MHz adapter into a Bus B 66 MHz slot will slow operation of all Bus B slots to 33 MHz.
5. Netfinity ServeRAID-3L Ultra2 SCSI Adapter II (P/N 19K0564) provides either one internal or one external (0.8-mm VHDCI) LVDS SCSI channel.
6. Netfinity ServeRAID-3HB Ultra2 SCSI Adapter (P/N 37L6086) provides one internal and 2 external (0.8-mm VHDCI) LVDS SCSI channels. The internal channel can be configured for external usage (0.8-mm VHDCI) providing a total of 3 external LVDS SCSI channels. Includes 32MB of mirrored battery-backup cache which helps protect against data loss in write-back cache mode in the event of a power outage or adapter maintenance.
7. ServeRAID-4L Ultra160 SCSI controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8-mm VHDCI.
8. ServeRAID-4M Ultra160 SCSI controller is powered by a 100MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two internal and two external Ultra160 connectors (only two connectors may be utilized). External connectors are 0.8-mm VHDCI.
9. ServeRAID-4H Ultra160 SCSI controller is powered by a 266MHz PowerPC 750 processor and provides 128 MB of battery-backed ECC cache with two internal and up to four external Ultra160 connectors (only four connectors may be utilized). External connectors are 0.8-mm VHDCI.
10. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilized.
11. See Fibre Array Solutions section for additional configuration information.
12. Netfinity 6000R has an integrated 10/100 PCI Ethernet Controller.
13. Early versions of Token-Ring 16/4 PCI Adapter 2 (P/N 34L0601) were keyed as Universal, while current versions are keyed for 5 V. All versions are supported in 5 V PCI slots only.
14. The Wake on LAN function of this option is not supported by this server.
15. Netfinity 6000R includes two USB ports, two serial and one parallel port.
16. Due to homologation variances, modem availability may differ by country.

17. See Appendix E for details on Serial I/O options and configuration limitations. A maximum of four Serial I/O adapters (any combination of P/N 37L1414, 37L1415, 37L1416, 37L1423) may be installed.
18. The Netfinity Advanced Systems Management Processor and Interconnect Bus integrated into Netfinity 6000R works with Netfinity Director to provide significant system management function. When used with optional Netfinity Advanced System Management PCI Adapter (P/N 01K7209) and Netfinity Advanced System Management Interconnect Cable Kit (P/N 03K9309) additional management and control of up to 12 service processors from a remote console through a single modem or LAN connection is possible.
19. Includes PCI adapter, Netfinity Advanced System Management Interconnect Cable Kit components and 56-watt AC adapter which requires a separate power source. Provides an integrated 10/100 Ethernet port and PCMCIA slot to support optional Netfinity Advanced System Management Token-Ring Connection (P/N 36L9654).
20. A maximum quantity of one is supported.
21. Required for all xSeries and Netfinity servers containing a standard Advanced System Management Processor that are to be interconnected for system management support through a LAN or modem connection (Netfinity 5500 models 8660-1…4xU are not supported). Up to 12 service processors may be interconnected (including standard and optional processors) with an aggregate connection length of no more than 91.4 meters (300 ft.). A customer-supplied Ethernet cable is required for each interconnection.
22. Contains an IBM Turbo 16/4 Token-Ring PCI Card, which installs in the PCMCIA card slot of Netfinity Advanced System Management PCI Adapter, and a PC Card to 9-pin D-Shell cable which is routed to an available adapter slot opening (reduces available slots by one). The Netfinity Advanced System Management PCI Adapter's integrated Ethernet port and Netfinity Advanced System Management Token-Ring Connection cannot be connected or used together.


Slot 1- Bus A- 33 MHz, 32-bit, 5 V or Universal
Slot 2- Bus B- 66 MHz, 64-bit, 3.3 V or Universal
Slot 3- Bus B- 66 MHz, 64-bit, 3.3 V or Universal
Slot 4- Bus B- 66 MHz, 64-bit, 3.3 V or Universal
Slot 5- Bus C- 33 MHz, 64-bit, 5 V or Universal
Slot 6- Bus C- 33 MHz, 64-bit, 5 V or Universal
All Slots- Full Length, Active PCI
Exterior Connector Access

Netfinity 6000R Power, Monitor & Accessories

Part Number	Description
	Power[1]
37L6880	270 W Hot-Swap Redundant Power Supply[2]
	Uninterruptible Power Supply (UPS)[3]
94G6674	APC Smart-UPS 1400RMB[4]
94G6676	APC Smart-UPS 3000RMB[4]
37L6861	APC Smart-UPS 5000RMB[5]
	Monitors[6]
633347N	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[7]
6331B2N	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[7]
6332J1N	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[7]
66274AN	G78 Color Monitor 17" (454-mm, 17.9" Viewable Image Size), stealth black[7]
9511AG1	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable), stealth black[8]

1. Netfinity 6000R systems include a single 270 W, hot-swap power supply and two 9 ft. power cords, one high voltage IEC 320-C13 and one low voltage IEC 320-C13 to
NEMA 5-15P. N+1 power supply redundancy may be achieved with the addition of optional 270 W Hot-Swap Redundant Power Supply (P/N 37L6880). Redundancy for configurations of greater than 270 W requires installation of a second optional supply. To assist in determining when an additional power supply is required to preserve redundancy, a "Non-Redundant LED" is a standard feature of the Netfinity 6000R. The following table is provided as a reference.

Number of Power Supplies	System Configuration Supported
	Non-Redundant
1	Up to two processors
	Up to three PCI adapters
	Up to three HDDs
	Up to eight memory RDIMMs

2. 270 W Hot-Swap Redundant Power Supply (P/N 37L6880) includes a single low voltage 9 ft. power cord.
3. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
4. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
5. Height is 5U. See "Rack and NetBAY" for supported IBM racks.
6. Netfinity 6000R uses an SVGA controller (S3 Savage4 chipset) with 8 MB of video memory.
7. Installation within a rack requires optional Monitor Compartment (P/N 94G7444).
8. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit II (P/N 37L6888) and Netfinity Rack Keyboard Tray (P/N 28L4707). A space saver keyboard may coexist within the same 28L4707 keyboard tray.

Part Number	Description
Rack and NetBAY[1]	
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack
9306910	Netfinity Rack (includes perforated front door)
36L9703	Netfinity Rack Extension Kit
9306200	Netfinity NetBAY22
36L9702	Netfinity NetBAY22 Rack Extension Kit
Keyboard and Mouse[2]	
28L3644	Space Saver II Keyboard[3, 4]
01K1260	TrackPoint IV 104-Key Black Keyboard[4, 5]
28L3621	Preferred Keyboard (stealth black)[5]
28L3673	Sleek 2-Button Stealth Black Mouse

1. Netfinity 6000R is housed in a 19" rack mountable drawer and requires one of the racks listed here. See "IBM Netfinity Rack Cabinet and Options" section for IBM rack supported devices.
2. Netfinity 6000R ships without a keyboard or mouse.
3. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
4. Advanced TrackPoint IV features are not available on IBM Netfinity systems.
5. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.

Netfinity 6000R Tape Options

Part Number	Description	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures
01K1325	20/40GB 8-mm Internal SCSI Tape Drive	N/A[1]	16	133 mm (5.25") HH	N	N	3551001
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive	N/A[1]	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	Y	N/A	3551001[2]
09N4040	20/40 GB DLT Internal SCSI Tape Drive	N/A[1]	8	133 mm (5.25") FH	N	Y	3551001
00N7990	40/80 GB DLT Internal SCSI Tape Drive	N/A[1]	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	3551001[2]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive	N/A[1]	16 Ultra2 LVD	133 mm (5.25") HH	N	N/A	3551001[2]
Tape Autoloaders							
00N7992	120/240GB DDS/4 Tape Autoloader	N/A[1]	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	3551001[2]
External Tape Libraries[3]							
3502R14	DLT Tape Library	-	16	Rack	Y	N/A	-
External Tape Enclosures							
3551001	NetMEDIA Storage Expansion Unit EL[4]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[5]	-	16 LVD	-	N	N	3551001
Associated Options							
10K2340	Media Bay Tray and LVD Cable Kit[6]	-	16 LVD	Int.	Y	N	3551001

1. Netfinity 6000R does not support internal tape drives. An external tape or tape enclosure must be used. If not used internally, the second integrated Ultra160 connector may be routed to an external 0.8-mm VHDCI connector with a cable included with the server. All tape drives and enclosures are supported by PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which has an external 0.8-mm VHDCI connector. Select tape drive, enclosure and supported adapter then use Appendix D: Cables-Storage Units-Controllers to select an appropriate external cable.
2.LVD support for LVD devices installed in a NetMEDIA Storage Expansion Unit EL (P/N 3551001) requires replacement of the standard single-ended internal cables with one or more (depending on configuration) cables from Media Bay Tray and LVD Cable Kit (P/N 10K2340) which contains a single two-drop mult-mode terminated cable. If the standard cables are used for attachment to LVD devices, single-ended SCSI rules and bus speeds apply.
3. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
4. NetMEDIA Storage Expansion Unit EL (P/N 3551001) is a black 3U, 19" rack or NetBAY3/3E mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included.
5. NetMEDIA Systems Management Adapter (P/N 10L7113) may be installed in a 3551001 to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the 3551001 is powered off. External connector is 0.8-mm VHDCI.
6. Media Bay Tray and LVD Cable Kit (P/N 10K2340) includes an internal two-drop multi-mode terminated LVD SCSI cable.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.

Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

Internet Server

Part Number	Description	Quantity
8682-1RY	Netfinity 6000R 700/1 MB Xeon, 512 MB(R) ECC, Open, 40X, PCI (Rack 4U)	1
19K0564	Netfinity ServeRAID-3L Ultra2 SCSI Adapter II	1
33L5050	Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit	1
37L7201	Netfinity 9.1 GB Ultra160 SCSI Hot-Swap SL HDD[1]	4
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive	1
3551001	NetMEDIA Storage Expansion Unit EL	1
03K9310	Netfinity 2 M Ultra2 SCSI Cable	1
6331B2N	E54 Color Monitor 15" (350 mm, 13.8" Viewable Image Size), stealth black	1
94G6674	APC Smart-UPS 1400RMB	1
Industry Standard 19" Rack, EIA-310D, min. depth of 28" (711 mm)		
9306200	Netfinity NetBAY22	1
28L3644	Space Saver II Keyboard	1
94G6670	Blank Filler Panel Kit	2

1. For a total of 18.2 GB of RAID protected, hot-swap, hot-spare internal storage.

An Internet server is a server that handles all requests from the Internet (intranet or extranet). Usually, this type of server has the same characteristics as a file server. The main difference is that an internet server talks a different language (TCP/IP vs. NETBEUI or IPX/SPX) and often needs to do an extra security check (firewall). In the case of an Internet server, the server itself talks mostly to just one client, the Internet Service Provider (ISP), instead of many clients like a file server does.

With this in mind, the IBM Netfinity 6000R was selected to provide an affordable price point for the growing internet server market, 512 MB of system memory (expandable to 16 GB), and availability features such as RAID protected internal hot-swap storage and power protection with an APC Smart-UPS.

The network configuration depends on the method that will be used to connect the server to the Internet. Usually fast Ethernet routers are used, but if other methods are used, you can add the appropriate adapter. The configuration includes a tape backup unit for secure backup of critical data in the event of a system or storage failure.

Application Server

Part Number	Description	Quantity
8682-2RY	Netfinity 6000R 700/2 MB Xeon, 512 MB(R) ECC, Open, 40X, PCI (Rack 4U)	1
00N7944	Netfinity 700 MHz/2 MB Upgrade with Pentium III Xeon Processor	3
33L3113	Netfinity 128 MB, 100 MHz ECC SDRAM RDIMM[1]	4
33L3115	Netfinity 256 MB, 100 MHz ECC SDRAM RDIMM[1]	4
33L5050	Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit	1
37L7203	Netfinity 36.4 GB Ultra160 SCSI Hot-Swap SL HDD[2]	4
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter	1
00N7990	40/80 GB DLT Internal SCSI Tape Drive	1
3551001	NetMEDIA Storage Expansion Unit EL	1
10L7113	NetMEDIA Systems Management Adapter	1
03K9310	Netfinity 2 M Ultra2 SCSI Cable	1
6331B2N	E54 Color Monitor 15" (350 mm, 13.8" Viewable Image Size), stealth black	1
94G6674	APC Smart-UPS 1400RMB	1
37L6880	Netfinity 270 W Hot-Swap Redundant Power Supply	2
Industry Standard 19" Rack, EIA-310D, min. depth of 28" (711 mm)		
9306200	Netfinity NetBAY22	1
28L3644	Space Saver II Keyboard	1
94G6670	Blank Filler Panel Kit	2

1. For a total of 2 GB of system memory.
2. For a total of 109.2 GB usable RAID 5 storage.

An application server is designed to handle a high workload while providing application serving requirements for users. With this in mind, the IBM Netfinity 6000R was selected to provide an affordable price point for an application server, with four-way Pentium III Xeon processing, 2 GB of system memory (expandable to 16 GB), and availability features such as battery-backed cache RAID protected internal hot-swap storage and power protection with an APC Smart-UPS.

IBM Netfinity 7100 Configurator

Part Number	Processor Speed (MHz)[2]	Number of Processors (Std./Max) L2 ECC Cache (KB)	Memory (Std./Max) (R = RDIMM)	Form Factor	Power Supply Quantity (Std./Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail) Internal Hard Disk Drive (Std./Max)	CD-ROM (IDE)	Bays: (Total/Avail) Slots: (Total/Avail)
8666-11Y	550	1/4	512	256MB(R)/16GB	Tower	2/4	P, H,F	S-Fans S-Power	Y	10/100	D,U2	4/2	0/364GB	40X- 17X[3]	14/12	6/6
8666-1RY[1]	550	1/4	512	256MB(R)/16GB	Rack(8U)	2/4	P, H,F	S-Fans S-Power	Y	10/100	D,U2	4/2	0/364GB	40X- 17X[3]	14/12	6/6
8666-21Y	550	1/4	1024	256MB(R)/16GB	Tower	2/4	P, H,F	S-Fans S-Power	Y	10/100	D,U2	4/2	0/364GB	40X- 17X[3]	14/12	6/6
8666-2RY[1]	550	1/4	1024	256MB(R)/16GB	Rack(8U)	2/4	P, H,F	S-Fans S-Power	Y	10/100	D,U2	4/2	0/364GB	40X- 17X[3]	14/12	6/6
8666-31Y	700	1/4	1024	256MB(R)/16GB	Tower	2/4	P, H,F	S-Fans S-Power	Y	10/100	D,U2	4/2	0/364GB	40X- 17X[3]	14/12	6/6
8666-3RY[1]	700	1/4	1024	256MB(R)/16GB	Rack (8U)	2/4	P, H,F	S-Fans S-Power	Y	10/100	D,U2	4/2	0/364GB	40X- 17X[3]	14/12	6/6
8666-41Y	700	1/4	2048	256MB(R)/16GB	Tower	2/4	P, H,F	S-Fans S-Power	Y	10/100	D,U2	4/2	0/364GB	40X- 17X[3]	14/12	6/6
8666-4RY[1]	700	1/4	2048	256MB(R)/16GB	Rack (8U)	2/4	P, H,F	S-Fans S-Power	Y	10/100	D,U2	4/2	0/364GB	40X- 17X[3]	14/12	6/6

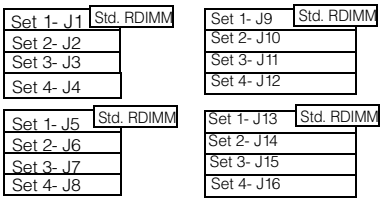
1. Housed in a 19" Rack mountable drawer and ships standard without a keyboard or mouse. See "Rack and NetBAY" under "Netfinity 7100 Power, Monitor & Accessories" for supported IBM racks.
2. Intel Pentium III processor with advanced transfer (full speed) L2 cache and 100 MHz access to memory and I/O buses.
3. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.

Netfinity 7100 Processor Upgrades

Part Number	Processor Upgrades with Full Speed Cache	SMP Support[1]	Processor Speed Upgrade[2]
33L5056	Netfinity 550 MHz/512 KB Upgrade II with Pentium III Xeon Processor	1xY	-
33L5057	Netfinity 550 MHz/1 MB Upgrade II with Pentium III Xeon Processor	2xY	All 1xY
10K2331	Netfinity 700 MHz/1 MB Upgrade II with Pentium III Xeon Processor	3xY	All 1…2xY
10K2332	Netfinity 700 MHz/2 MB Upgrade II with Pentium III Xeon Processor	4xY	All 1…3xY

1. Three additional processors may be installed, providing a maximum of four. All processors must be identical in type, speed, and cache size.
2. Requires removal of the standard processor. A maximum of four processors may be installed. All processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".

Netfinity 7100 Memory



All RDIMMs installed in each set must be the same size, but all the sets do not have to contain RDIMMs of the same size. Install RDIMM sets in numerical sequence from 1 to 4.

Total Memory[1]	Quantity of RDIMMs Added[2]				
	64 MB (33L3067)	128 MB (33L3113)	256 MB (33L3115)	512 MB (33L3117)	1 GB (33L3119)
256 MB	4 x 64 RDIMMs Standard	-	-	-	-
512 MB	4	-	-	-	-
768 MB	-	4	-	-	-
1.0 GB	4	4	-	-	-
1.2 GB	-	-	4	-	-
1.7 GB	-	4	4	-	-
2.0 GB	4	4	4	-	-
2.7 GB	-	4	-	4	-
3.0 Gb	4	4	-	4	-
3.2 GB	-	-	4	4	-
3.7 GB	-	4	4	4	-
4 GB[3]	-	8	4	4	-
5 GB[3]	-	-	12	4	-
6 GB[3]	-	-	8	8	-
7 GB[3]	-	-	4	12	-
8 GB[3]	-	-	-	16	-
9 GB[3]	-	-	4	8	4
10 GB[3]	-	-	-	12	4
12 GB[3]	-	-	-	8	8
14 GB[3]	-	-	-	4	12
16 GB[3] (max)	-	-	-	-	16

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller RDIMMs may provide a more cost-effective alternative to using larger RDIMMs.
1. Network Operating Systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. To obtain the quantity of memory identified in the "Total Memory" column, select the appropriate row and order the quantity of RDIMMs identified in all columns for that row. Example: For 1.0 GB, order 4 x 33L3067 and 4 x 33L3113.
3. Requires removal of standard memory DIMMs.

Part Number	Memory Description[1]	Upgrade 10K2169 Compatible[2]
33L3067	Netfinity 64 MB, 100 MHz ECC SDRAM RDIMM	-
33L3113	Netfinity 128 MB, 100 MHz ECC SDRAM RDIMM	X
33L3115	Netfinity 256 MB, 100 MHz ECC SDRAM RDIMM	X
33L3117	Netfinity 512 MB, 100 MHz ECC SDRAM RDIMM	X
33L3119	Netfinity 1 GB 100 MHz ECC SDRAM RDIMM	X
10K2169	Netfinity Active PCI/Chipkill Upgrade Kit[3]	X

1. Due to four-way interleaving all RDIMMs installed in each set must be the same size, but all the sets do not have to contain RDIMMs of the same size. Memory must be installed in sets of four identical RDIMMs (example: quantity 4 of 33L3113). Install RDIMM sets in numerical sequence from Set 1 to Set 4.
2. Memory designated by an "X" may be used with NetfinityActive PCI/Chipkill Upgrade Kit (P/N 10K2169).
3. Netfinity Active PCI/Chipkill Upgrade Kit (P/N 10K2169) provides an upgrade to hot-swap PCI slots and "Chipkill" ECC memory.

Netfinity 7100 Hard Disk Drive (HDD) Storage

Total Int. Storage[1]	7200RPM Hard Disk Drives (HDDs)			10,000RPM Hard Disk Drives (HDDs)		
	9.1 GB (P/N 36L9744 or 37L7201)[2]	18.2 GB (P/N 36L9745 or 37L7202)[2]	36.4 GB (P/N 36L9746 or 37L7203)[2]	9.1 GB (P/N 36L9748 or 37L7204)[2]	18.2 GB (P/N 36L9749 or 37L7205)[2]	36.4 GB (P/N 36L9750 or 37L7206)[2]
0 GB	Standard on Base Models			Standard on Base Models		
9.1 GB	1	-	-	1	-	-
18.2 GB	2	1	-	2	1	-
27.3 GB	3	-	-	3	-	-
36.4 GB	4	2	1	4	2	1
45.5 GB	5	-	-	5	-	-
54.6 GB	6	3	-	6	3	-
63.7GB	7	-	-	7	-	-
72.8 GB	8	4	2	8	4	2
81.9GB	9	-	-	9	-	-
91 GB	10	5	-	10	5	-
109.2 GB	-	6	3	-	6	3
127.4GB	-	7	-	-	7	-
145.6GB	-	8	4	-	8	4
163.8GB	-	9	-	-	9	-
182GB	-	10	5	-	10	5
218.4GB	-	-	6	-	-	6
254.8GB	-	-	7	-	-	7
291.2 GB	-	-	8[3]	-	-	8[3]
327.6 GB	-	-	9[3]	-	-	9[3]
364 GB (max)	-	-	10[3]	-	-	10[3]

This table does not represent all possible hard drive configurations.
1. Select a total storage row then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within ± 0.2 GB unless otherwise noted.
2. Netfinity 7100 contains an Ultra2 hot-swap backplane which limits Ultra160 HDDs to Ultra2 bus speeds.
3. Part numbers 36L9746 and 36L9750 are half-high devices and therefore cannot be utilized for configurations requiring greater than a quantity of seven.

Bay	Form Factor	Height	Front Access	Usage
-	89 mm (3.5")	SL	Yes	Diskette
-	133 mm (5.25")	HH	Yes	IDE CD-ROM
RM 1	133 mm (5.25")	HH[1]	Yes	Open
RM 2	133 mm (5.25")	HH[1]	Yes	Open
1…10 or 1…7	HS	SL or HH[2]	Yes	Open
NB3[3]	19" Rack	3U	Yes	Open

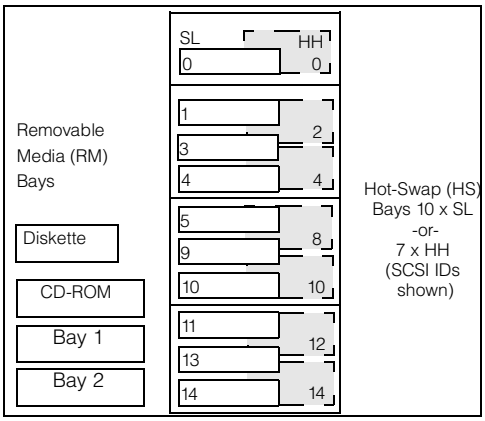
Part Number	Description	RPM	Height	Bays Supported	Max. Qty.
	Ultra2 Hard Disk Drives (HDD)				
36L9744	Netfinity 9.1 GB Wide Ultra2 SCSI Hot-Swap SL HDD	7200	SL	See diagram	10
36L9745	Netfinity 18.2 GB Wide Ultra2 SCSI Hot-Swap SL HDD	7200	SL	See diagram	10
36L9746	Netfinity 36.4 GB Wide Ultra2 SCSI Hot-Swap HDD	7200	HH[2]	See diagram	7
36L9748	Netfinity 9.1 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	10,000	SL	See diagram	10
36L9749	Netfinity 18.2 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	10,000	SL	See diagram	10

1. Two half-high (HH) bays can be combined to support a single full-high (FH) device
2. The top bay is HH; all others are configured in groups of 3 SL bays. When a HH drive is installed in one of these groups, only another HH or a single SL drive can be installed in the same group. For clarity, the SCSI IDs are identified.
3. Tower configured systems support installation of up to 3 NetBAY3s. See IBM Netfinity NetBAY3 Stackable Enclosure section for supported devices.

36L9750	Netfinity 36.4 GB 10K-3 Wide Ultra2 SCSI Hot-Swap HDD	10,000	HH[2]	See diagram	7
Ultra160 Hard Disk Drives (HDD)[1]					
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	See diagram	10
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	See diagram	10
37L7203	36.4 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	See diagram	10
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	See diagram	10
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	See diagram	10
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	See diagram	10
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	See diagram	10
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	See diagram	10

	External Storage Expansion Units[3]	Form Factor
35301RU	Netfinity EXP200 Storage Expansion Unit[4]	Rack (3U)
37L5857	Netfiinity EXP200 Rack-to-Tower Conversion Kit	-
37L0075	Netfinity EXP200 350 W Redundant Power Supply	-
35311RU	EXP300 Storage Expansion Unit[5]	Rack (3U)
09N7296	EXP300 Rack-to-Tower Conversion Kit	-
35601RU	FAStT EXP500 Storage Expansion Unit[6]	Rack (3U)

1. Netfinity 7100 contains an Ultra2 hot-swap backplane which limits Ultra160 HDDs to Ultra2 bus speeds.
2. Two slim-line (SL) bays can be combined to support a single half-high (HH) device. See Bay diagram for identification of which bays can be combined. A mixture of HH, SL, 10,000 rpm and 7,200 rpm drives is supported.
3. Not supported by the onboard external SCSI port. Select an optional SCSI controller then refer to Appendix D: Cables-Storage Units-Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
4. Netfinity EXP200 includes a single 2 M Ultra2 SCSI cable and a single hot-swap 350 W power supply and power cord. Optional hot-swap Netfinity EXP200 350 W Redundant Power Supply (P/N 37L0075) includes an additional power cord. To convert an EXP200 to a tower form factor, Netfinity EXP200 Rack-to-Tower Conversion Kit (P/N 37L5857) is required.
5. EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500 W power supplies, each with its own power cord. To convert an EXP300 to a tower form factor, Netfinity EXP300 Rack-to-Tower Conversion Kit (P/N 09N7296) is required.
6. FAStT EXP500 Storage Expansion Unit (P/N 35601RU) includes dual hot-swap 350 W power supplies, each with its own power cord.



1. The top bay is HH; all others are configured in groups of three SL bays. When a HH drive is installed in one of these groups, only another HH or a single SL drive can be installed in the same group. For clarity, the SCSI IDs are identified.

Netfinity 7100 Internal SCSI Cabling

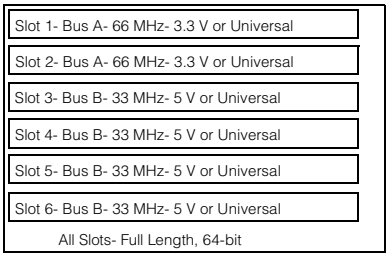
The Netfinity 7100 contains a DASD backplane supporting ten hot-swap, SCA-2 compliant drive bays. The backplane is connected to Channel B of the integrated dual-channel, Wide Ultra2 SCSI controller through a 16-bit LVD SCSI cable. Channel A only supports external SCSI attachment and is cabled directly to the external 0.8mm VHDCI SCSI connector. To support devices in the internal 133/89-mm (5.25/3.5-inch) half-high bays, a two-drop, 16-bit LVD SCSI cable with integrated terminator is included with the server. This cable can be used to connect to an optional SCSI adapter or, in the case of RAID configurations where the backplane cable is attached to an optional RAID adapter, it can be connected to the Channel B connector.

Netfinity 7100 I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported[1]	Hot-Plug[2]	PCI Voltage Key	MHz
	Storage Controllers[3]						
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter[4]	Full	32/64-bit	3..6	X[2]	5	33
37L6091	ServeRAID-4L Ultra160 SCSI Controller[5]	Full	32/64-bit	1..6	X	Universal	33
37L6080	ServeRAID-4M Ultra160 SCSI Controller[6]	Full	32/64-bit	1..6	X	Universal	33
37L6889	ServeRAID-4H Ultra160 SCSI Controller[7]	Full	32/64-bit	1..6	X	Universal	33
19K4646	PCI Wide Ultra160 SCSI Adapter[18]	Half	32/64-bit	1..6	-	Universal	66
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	3..6	-	5	33
	Fiber Storage Controllers and Options[8]						
35261RU	Netfinity Fibre Channel RAID Controller Unit	-	-	-	-	-	-
01K7296	Netfinity Fibre Channel Failsafe RAID Controller	-	-	-	-	-	-
35231RU	Netfinity Fibre Channel Hub	-	-	-	-	-	-
00N6881	Netfinity FAStT Host Adapter	Half	32/64-bit	1..6	X[2]	Universal	66
35521RU	FAStT500 Storage Server	-	-	-	-	-	-
35421RU	FAStT200 Storage Server	-	-	-	-	-	-
35422RU	FAStT200 HA Storage Server	-	-	-	-	-	-
19K1121	FAStT200 Redundant RAID Controller	-	-	-	-	-	-
00N6883	Netfinity FAStT500 256 MB Cache	-	-	-	-	-	-
2108R3S	SAN Data Gateway Router (Single-Ended)	-	-	-	-	-	-
2108R3D	SAN Data Gateway Router (Differential)	-	-	-	-	-	-
2109S08	SAN Fibre Channel Switch, 8-Port	-	-	-	-	-	-
2109S16	SAN Fibre Channel Switch, 16-Port	-	-	-	-	-	-
	Networking[9]						
	Ethernet						
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1..6	X[2]	Universal	33
34L0301	Netfinity Gigabit Ethernet SX Adapter	Half	32/64-bit	1..6	X[2]	Universal	33
	Token Ring						
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN[10]	Half	32-bit	1..6	X[2]	Universal	33
34L5001	16/4 Token-Ring PCI Management Adapter[10]	Half	32-bit	1..6	X[2]	Universal	33
34L5201	High-Speed 100/16/4 Token-Ring PCI Management Adapter	Half	32-bit	1..6	X[2]	Universal	33
	Communications[11]						
33L4618	PCI V.90 56 Data/Fax Modem[12]	Half	32-bit	3..6	-	5	33
	Systems Management[13]						
01K7209	Netfinity Advanced System Management PCI Adapter[14]	Full	32-bit	3..6[15]	-	5	33
03K9309	Netfinity Advanced System Management Interconnect Cable Kit[16]	-	-	-	-	-	-
36L9654	Netfinity Advanced System Management Token-RIng Connection[17]	-	-	-	-	-	-
	Host Attach						
9086001	Netfinity ESCON Adapter[19]	Full	32-bit	3..6[20]	-	5	33
	Other						
10K2169	Netfinity Active PCI/Chipkill Upgrade Kit[2]	-	-	3..6	X	-	-

1.The 5 V slots support Universal or 5 V adapters. The 3.3 V slots support 3.3 V adapters. A Universal Keyed 66 MHz adapter plugged into a 33 MHz slot will operate at 33 MHz. A Universal Keyed 33 MHz adapter plugged into a 66 MHz slot limits other adapters installed on the same bus to 33 MHz.
2. Netfinity 7100 does not ship with hot-plug PCI slots. The addition of optional Netfinity Active PCI/Chipkill Upgrade Kit (P/N 10K2169) provides slots 3-6 with hot-plug capability using IBM's Active PCI technology. For Network Operating System support access URL www.ibm.com/pc/us/compat
3.Netfinity 7100 includes a dual-port, dual-channel, 64-bit Wide Ultra2 SCSI controller with one internal connector and one external port with a 0.8-mm Very High Density Connection Interface (VHDCI).
4. Netfinity ServeRAID-3HB Ultra2 SCSI Adapter (P/N 37L6086) provides one internal and 2 external (0.8-mm VHDCI) LVDS SCSI channels. The internal channel can be configured for external usage (0.8-mm VHDCI connector) providing a total of 3 external LVDS SCSI channels. Includes 32MB of mirrored battery-backup cache which helps protect against data loss in write-back cache mode in the event of a power outage or adapter maintenance.
5. ServeRAID-4L Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and either one internal or one external Ultra160 connection. External connectors are 0.8-mm VHDCI.
6. ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two internal and two external Ultra160 connectors (only two connectors may be utilized). External connectors are 0.8-mm VHDCI.
7. ServeRAID-4H Ultra160 SCSI Controller is powered by a 266 MHz PowerPC 750 processor and provides 128 MB of battery-backed ECC cache with two internal and up to four external Ultra160 connectors (only four connectors may be utilized). External connectors are 0.8-mm VHDCI.
8. See Netfinity Fibre Array Solutions section for additional configuration information.
9. Netfinity 7100 includes a full-duplex, 10/100 Mbps Ethernet PCI Controller.
10. The Wake on LAN function of this option is not supported by this server.
11. Netfinity 7100 includes two USB ports, two high-speed serial/asynchronous ports, (NS16550A compatible), and one high-speed (up to 2 MB/sec. data transfer speed) bi-directional parallel port supporting devices using ECP/EPP/SSP protocols adhering to the IEEE 1284 standard.
12. Due to homologation variances, modem availability may differ by country.

13. The Netfinity Advanced Systems Management Processor and Interconnect Bus integrated into Netfinity 7100 works with Netfinity Director to provide significant system management function. When used with optional Netfinity Advanced System Management PCI Adapter (P/N 01K7209) and Netfinity Advanced System Management Interconnect Cable Kit (P/N 03K9309) additional management and control of up to 12 service processors from a remote console through a single modem or LAN connection is possible.
14. Includes PCI adapter, Netfinity Advanced System Management Interconnect Cable Kit components and 56-watt AC adapter which requires a separate power source. Provides an integrated 10/100 Ethernet port and PCMCIA slot to support optional Netfinity Advanced System Management Token-Ring Connection (P/N 36L9654).
15. A maximum quantity of one is supported.
16. Required for all xSeries and Netfinity servers containing a standard Advanced System Management Processor that are to be interconnected for system management support through a LAN or modem connection (Netfinity 5500 models 8660-1. . .4xU are not supported). Up to 12 service processors may be interconnected (including standard and optional processors) with an aggregate connection length of no more than 91.4 meters (300 ft.). A customer-supplied Ethernet cable is required for each interconnection.
17. Contains an IBM Turbo 16/4 Token-Ring PCI Card, which installs in the PCMCIA card slot of Netfinity Advanced System Management PCI Adapter), and a PC Card to 9-pin D-Shell cable which is routed to a rear chassis cut-out. The Netfinity Advanced System Management PCI Adapter's integrated Ethernet port and Netfinity Advanced System Management Token-Ring Connection cannot be connected or used together. To download the latest firmware access URL www.pc.ibm.com/us/netfinity. Select "Server Support", "Family", "Model", "Downloadable files", and finally "Advanced Systems Management".
18. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilized.
19. Provides an ESCON MIC and a DB9 Serial Port. Cables are not included but are available through S/390 channels. Contact your IBM representative for additional information.
20. A maximum of two 9086001 adapters (installed in non-adjacent slots) are supported in a single server.


Slot 1- Bus A- 66 MHz- 3.3 V or Universal
Slot 2- Bus A- 66 MHz- 3.3 V or Universal
Slot 3- Bus B- 33 MHz- 5 V or Universal
Slot 4- Bus B- 33 MHz- 5 V or Universal
Slot 5- Bus B- 33 MHz- 5 V or Universal
Slot 6- Bus B- 33 MHz- 5 V or Universal
All Slots- Full Length, 64-bit

Netfinity 7100 Power, Monitor & Accessories

Part Number	Description
	Power[1]
33L3760	250 W Hot-Swap Redundant Power Supply
	Uninterruptible Power Supply (UPS)[2]
94G3135	APC Smart-UPS 1000
94G3136	APC Smart-UPS 1400
94G6674	APC Smart-UPS 1400RMB[3]
94G6676	APC Smart-UPS 3000RMB[3]
37L6861	APC Smart-UPS 5000RMB[4]
	Monitors[5]
633347N	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
6331B2N	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
6332J1N	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[6]
66274AN	G78 Color Monitor 17" (454-mm, 17.9" Viewable Image Size), stealth black[6]
9511AG1	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable), stealth black[7]

1. Netfinity 7100 includes two 250W hot-swap redundant power supplies, with the ability to accept up to two additional 250 W Hot-Swap Redundant Power
Supplies (P/N 33L3760). Each power supply includes its own 9-foot power cord for attachment to a low voltage UPS, PDU or wall outlet. To assist in determining when an additional power supply is required to preserve redundancy, a "Non-Redundant LED" is a standard feature of the Netfinity 7100. Predicting whether or not a particular configuration will require an additional power supply for redundancy is very complex. However, once the system is installed, the "Non-Redundant LED" will indicate when an additional power supply is required. The following sample configuration is provided as a reference.

Number of Power Supplies	System Configuration Supported
	Typical Non-Redundant Configuration
2	2 x Processors
	3 x PCI Adapters
	4 x Half-High or 5 Slim-Line HDDs
	8 x 512 MB RDIMMs
	Typical Redundant Configuration
3[8]	4 x Processors
	6 x PCI Adapters
	7 x Half-High or 10 Slim-Line HDDs
	16 x 512 MB RDIMMs
4	**Full Configuration with Redundancy**

2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate
3. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
4. Height is 5U. See "Rack and NetBAY" for supported IBM racks.
5. Netfinity 7100 uses an SVGA controller (S3 Trio 3D chipset) with 4 MB of video memory.
6. Installation within a rack requires optional Monitor Compartment (P/N 94G7444).
7. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit II (P/N 37L6888) and Netfinity Rack Keyboard Tray (P/N 28L4707). A space saver keyboard may coexist within the same 28L4707 keyboard tray.
8. The addition of a DLT tape drive may require a fourth power supply to preserve redundancy.

Part Number	Description
Conversion Kits	
37L6860	8Ux24D Rack-to-Tower Kit[1]
37L6859	8Ux24D Tower-to-Rack Kit
Rack and NetBAY[2]	
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack
9306910	Netfinity Rack (includes perforated front door)
9306200	Netfinity NetBAY22
10L6912	Netfinity NetBAY3[3]
10L6913	Netfinity Caster Set
Keyboard and Mouse[4]	
28L3644	Space Saver II Keyboard[5, 7]
01K1260	TrackPoint IV 104-Key Black Keyboard[6,7]
28L3621	Preferred Keyboard (stealth black)[6]
28L3673	Sleek 2-Button Stealth Black Mouse

1. Includes one Netfinity NetBAY3 with casters.
2. Netfinity 7100 rack models are housed in a 19" rack mountable drawer and require one of the racks listed here. Tower models require 8Ux24D Tower-to-Rack Kit (P/N 37L6859) for installation in a rack.
3. Netfinity 7100 tower models require 8Ux24D Rack-to-Tower Kit (P/N 37L6860) for use with a NetBAY3. A maximum of three NetBAY3 enclosures, including the one which ships with the conversion kit, may be stacked beneath a supported Netfinity tower server. Optional NetBAY3s must be shipped separately and not while attached to the base configuration. See IBM Netfinity NetBAY3 Stackable Enclosure section for supported devices.
4. Tower models includes both a mouse and keyboard. Rack models include neither.
5. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
6. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.
7. Advanced TrackPoint IV features are not available on IBM Netfinity systems.

Netfinity 7100 Tape Options

Part Number	Tape Drives	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive[1]	1, 2	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	Y	N/A	3510020, 3551001[2]
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive[1]	1, 2	16	133 mm (5.25") HH	N	N/A	3510020[3], 3551001
00N7990	40/80 GB DLT Internal SCSI Tape Drive[1]	1/2	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	3503B0X[3], 3551001[2]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive[1]	1, 2	16 Ultra2 LVD	133 mm (5.25") HH	N	N/A	3510020[3], 3551001[2]
Tape Autoloaders							
3502108	DLT Tape Autoloader	N/A	16	Desktop	Y	N/A	-
00N7992	120/240GB DDS/4 Tape Autoloader[1]	1/2	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	3551001[2]
External Tape Libraries[4]							
3502x14	DLT Tape Library	-	16	Desktop or Rack	Y	-	-
External Tape Enclosures							
3510020	External Half High SCSI Storage Enclosure[5]	-	8/16	Desktop	N	N	-
3503B0X	DLT External SCSI Enclosure[6]		16	Desktop	N	N	-
3551001	NetMEDIA Storage Expansion Unit EL[7]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[8]	-	16 LVD	-	N	N	3551001

Associated Options							
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	Ext.	Y	N	3510020, 3503B0X
10K2340	Media BayTray and LVD Cable Kit[9]	-	16 LVD	Int.	Y	N	3551001

Note: Netfinity 7100 includes an external 0.8-mm VHDCI connector.

1. Non-RAID Configurations require PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which contains a five-drop multi-mode terminated LVD SCSI cable. RAID configurations where the hot-swap backplane is cabled to a RAID controller, utilize the included two-drop multi-mode terminated LVD SCSI cable ito attach internal tapes to the onboard controller.
2. LVD support for LVD devices requires installation of the 16-bit multi-mode terminated, two-drop, SCSI cable included with optional Media Bay Tray and LVD Cable Kit (P/N 10K2340).
3. Requires 68-pin External Multimode LVD/SE SCSI terminator (P/N 00N7956).
4. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
5. Provides a black desktop 133 mm (5.25") half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
6. Provides a black desktop DLT tape enclosure with a 68-pin high density external connector. Requires termination by the tape drive or by installation of an External Multimode LVD/SE SCSI terminator (P/N 00N7956).
7. NetMEDIA Storage Expansion Unit EL (P/N 3551001) is a black 3U, 19" rack or NetBAY3/3E mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included.
8. NetMEDIA Systems Management Adapter (P/N 10L7113) may be installed in a 3551001 to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the 3551001 is powered off. External connector is 0.8-mm VHDCI.
9. Media Bay Tray and LVD Cable Kit (P/N 10K2340) includes an internal two-drop multi-mode terminated LVD SCSI cable.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.

For a complete list of all IBM and non-IBM option compatibility with Network Operating Systems and IBM Netfinity Servers, access the ServerProven™ compatibility pages on the Web at URL www.ibm.com/pc/us/compat.

Netfinity 7100 Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

High Availability Application Server

Part Number	Description	Quantity	Usage
8666-41Y	Netfinity 7100 700/2 MB Xeon, 256 MB(R) ECC, Open, 40X, PCI	1	-
33L3067	Netfinity 64 MB, 100 MHz ECC SDRAM RDIMM	4	-
33L3113	Netfinity 128 MB, 100 MHz ECC SDRAM RDIMM	4	-
33L3115	Netfinity 256 MB, 100 MHz ECC SDRAM RDIMM	4	2 GB Total System Memory
10K2332	Netfinity 700 MHz/2 MB Upgrade II with Pentium III Xeon Processor	2	Total of 3 SMP processors
36L9744	Netfinity 9.1 GB Wide Ultra2 SCSI Hot-Swap SL HDD	2	9.1 GB mirrored for NOS
36L9745	Netfinity 18.2 GB Wide Ultra2 SCSI Hot-Swap SL HDD	6	72 GB RAID 5 with hot-spare
00N7900	40/80 GB DLT Internal SCSI Tape Drive	1	-
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter	1	RAID 1 for NOS, RAID 5 for data
33L3760	250 W Hot-Swap Redundant Power Supply	1	Full power redundancy
66274AN	G78 Color Monitor 17" (406.4 mm, 16" Viewable Image Size), stealth black	1	
94G3136	APC Smart-UPS 1400	1	UPS

This tower server is configured to act as the foundation for business critical applications, applications your business cannot afford to be without. Configured with enough disk drives to mirror the operating system and provide a standard RAID 5 environment for data, optional hot-swap redundant power and UPS for power even during a blackout, this server represents the leading edge in high availability. An internal tape drive is included to back up that all important asset…data. A modem could be included to allow out-of-band (non-LAN) system management utilizing the integrated Netfinity Advanced System Management Processor.

Server Consolidation

Part Number	Description	Quantity	Usage
8666-31Y	Netfinity 7100 700 MHz/1 MB Xeon, 256 MB(R) ECC, Open, 40X, PCI	1	-
33L3113	Netfinity 128 MB, 100 MHz ECC SDRAM RDIMM	4	768 MB Total System Memory
10K2331	Netfinity 700 MHz/1 MB Upgrade II with Pentium III Xeon Processor	1	Total of 2 SMP processors
36L9748	Netfinity 9.1 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	2	9.1 GB mirrored for NOS
36L9749	Netfinity 18.2 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	8	109 GB RAID 5 with hot-spare
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter	1	RAID 1 for NOS, RAID 5 for data
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	2	Total of 3 Ethernet connections
00N7990	40/80 GB DLT Internal SCSI Tape Drive	1	-
33L3760	250 W Hot-Swap Redundant Power Supply	1	Full Power Redundancy
66274AN	G78 Color Monitor 17" (406.4 mm, 16" Viewable Image Size), stealth black	1	-
94G3136	APC Smart-UPS 1400	1	UPS

This tower model is configured to meet the need of server consolidation. Many businesses are trying to get their arms around the dispersed departmental servers that have grown up around the enterprise. By moving multiple servers onto one platform there is only one system to manage, both hardware and software. There is potentially less expense for service, software licenses, etc., and there is no need to worry about putting all your eggs in one basket because the Netfinity 7100 is designed for high availability. This configuration includes 109 GB of internal HDD storage, features a third power supply which provides fully redundant power, a UPS to help protect the system against a momentary electricity loss, and an internal tape drive that backs up, up to 80 GB per tape…in addition to all the standard features of the Netfinity 7100.

IBM Netfinity 7600 Configurator

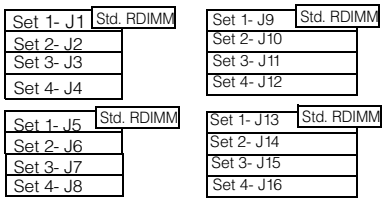
Part Number	Processor Speed (MHz)[2]	Number of Processors (Std./Max) L2 ECC Cache (KB)	Memory (Std./Max) (R = RDIMM)[3]	Form Factor	Power Supply Quantity (Std./Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail) Internal Hard Disk Drive (Std./Max)	CD-ROM (IDE)	Bays: (Total/Avail) Slots: (Total/Avail)
8665-1RY[1]	550	1/4	1024	512MB(R)/16GB	Rack(8U)	3/4	P, S, H,F	S-Fans S-Power[4]	Y	10/100	D,U2, R[5]	4/2	0/364GB	40X- 17X[6]	14/12	6/5
8665-2RY[1]	550	1/4	2048	512MB(R)/16GB	Rack(8U)	3/4	P, S, H,F	S-Fans S-Power[4]	Y	10/100	D,U2, R[5]	4/2	0/364GB	40X- 17X[6]	14/12	6/5
8665-3RY[1]	700	1/4	2048	512MB(R)/16GB	Rack(8U)	3/4	P, S, H,F	S-Fans S-Power[4]	Y	10/100	D,U2, R[5]	4/2	0/364GB	40X- 17X[6]	14/12	6/5
8665-4RY[1]	700	1/4	1024	512MB(R)/16GB	Rack(8U)	3/4	P, S, H,F	S-Fans S-Power[4]	Y	10/100	D,U2, R[7]	4/2	0/364GB	40X- 17X[6]	14/12	6/5
8665-5RY[1]	700	1/4	2048	512MB(R)/16GB	Rack(8U)	3/4	P, S, H,F	S-Fans S-Power[4]	Y	10/100	D,U2, R[7]	4/2	0/364GB	40X- 17X[6]	14/12	6/5

1. Housed in a 19" Rack mountable drawer and ships standard without a keyboard or mouse. See "Rack and NetBAY" under "Netfinity 7600 Power, Monitor & Accessories" for supported IBM racks.
2. Intel Pentium III Xeon processor with advanced transfer (full speed) L2 cache and 100 MHz access to memory and I/O buses.
3. Advanced Chipkill ECC memory corrects two-, three-, and four-bit memory errors.
4. Robust configurations may require optional 250 W Hot-Swap Redundant Power Supply (P/N 33L3760) for redundancy. See "Power" under Netfinity 7600 Power, Monitor & Accessories" for additional information.
5. RAID adapter is equivalent to Netfinity ServeRAID-3HB Ultra2 SCSI Adapter (P/N 37L6086).
6. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
7. RAID adapter is equivalent to ServeRAID-4M Ultra160 SCSI Controller (P/N 37L6080).

Netfinity 7600 Processor Upgrades

Part Number	Processor Upgrades with Full Speed Cache	SMP Support[1]	Processor Speed Upgrade[2]
33L5057	Netfinity 550 MHz/1 MB Upgrade II with Pentium III Xeon Processor	1xY	-
33L5058	Netfinity 550 MHz/2 MB Upgrade II with Pentium III Xeon Processor	2xY	1xY
10K2331	Netfinity 700 MHz/1 MB Upgrade II with Pentium III Xeon Processor	4xY	All 1…2xY
10K2332	Netfinity 700 MHz/2 MB Upgrade II with Pentium III Xeon Processor	3xY, 5xY	All 1…2xY, 4xY

1. Three additional processors may be installed, providing a maximum of four. All processors must be identical in type, speed, and cache size.
2. Requires removal of the standard processor. A maximum of four processors may be installed. All processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".



All RDIMMs installed in each set must be the same size, but all the sets do not have to contain RDIMMs of the same size. Install RDIMM sets in numerical sequence from 1 to 4.

Total Memory[1]	Quantity of RDIMMs Added[2]			
	128 MB (33L3113)	256 MB (33L3115)	512 MB (33L3117)	1 GB (33L3119)
512 MB	4 x 128 RDIMMs standard	-	-	-
1.0 GB	4	-	-	-
1.5 GB	-	4	-	-
2.0 GB	4	4	-	-
2.5 GB	-	8	-	-
3.0 GB	4	-	4	-
4 GB	4	4	4	-
5 GB	4	-	8	-
6 GB[3]	-	8	8	-
7 GB[3]	-	4	12	-
8 GB[3]	-	-	16	-
9 GB	4	-	-	8
10 GB[3]	-	-	12	4
12 GB[3]	-	-	8	8
14 GB[3]	-	-	4	12
16 GB[3] (max)	-	-	-	16

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller RDIMMs may provide a more cost-effective alternative to using larger RDIMMs.
1. Network Operating Systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. To obtain the Quantity of memory identified in the "Total Memory" column, select the appropriate row and order the quantity of RDIMMs identified in all columns for that row. Example: For 2.0 GB, order 4 x 33L3113 plus 4 x 33l3115.
3. Requires removal of standard RDIMMs.

Part Number	Memory Description[1]
33L3113	Netfinity 128 MB, 100 MHz ECC SDRAM RDIMM
33L3115	Netfinity 256 MB, 100 MHz ECC SDRAM RDIMM
33L3117	Netfinity 512 MB, 100 MHz ECC SDRAM RDIMM
33L3119	Netfinity 1 GB 100 MHz ECC SDRAM RDIMM

1. Due to four-way interleaving all RDIMMs installed in each set must be the same size, but all the sets do not have to contain RDIMMs of the same size. Memory must be installed in sets of four identical RDIMMs (example: quantity 4 of 33L3113). Install RDIMM sets in numerical sequence from Set 1 to Set 4. Chipkill support is provided on the memory card.

Netfinity 7600 Hard Disk Drive (HDD) Storage

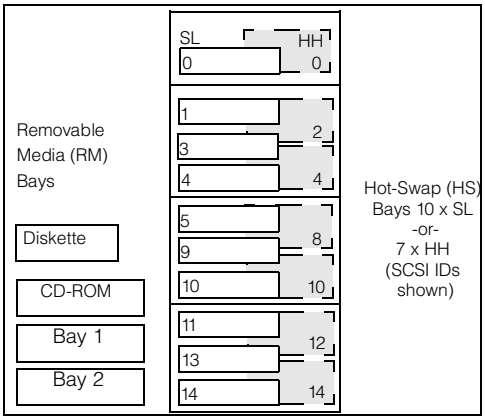
Total Int. Storage[1]	7200RPM Hard Disk Drives (HDDs)			10,000RPM Hard Disk Drives (HDDs)		
	9.1 GB (P/N 36L9744 or 37L7201)[2]	18.2 GB (P/N 36L9745 or 37L7202)[2]	36.4 GB (P/N 36L9746 or 37L7203)[2]	9.1 GB (P/N 36L9748 or 37L7204)[2]	18.2 GB (P/N 36L9749 or 37L7205)[2]	36.4 GB (P/N 36L9750 or 37L7206)[2]
0 GB	Standard on Base Models			Standard on Base Models		
9.1 GB	1	-	-	1	-	-
18.2 GB	2	1	-	2	1	-
27.3 GB	3	-	-	3	-	-
36.4 GB	4	2	1	4	2	1
45.5 GB	5	-	-	5	-	-
54.6 GB	6	3	-	6	3	-
63.7GB	7	-	-	7	-	-
72.8 GB	8	4	2	8	4	2
81.9GB	9	-	-	9	-	-
91 GB	10	5	-	10	5	-
109.2 GB	-	6	3	-	6	3
127.4GB	-	7	-	-	7	-
145.6GB	-	8	4	-	8	4
163.8GB	-	9	-	-	9	-
182GB	-	10	5	-	10	5
218.4GB	-	-	6	-	-	6
254.8GB	-	-	7	-	-	7
291.2 GB	-	-	8[3]	-	-	8[3]
327.6 GB	-	-	9[3]	-	-	9[3]
364 GB (max)	-	-	10[3]	-	-	10[3]

This table does not represent all possible hard drive configurations.
1. Select a total storage row then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within ± 0.2 GB unless otherwise noted.
2. Netfinity 7600 contains an Ultra2 hot-swap backplane which limits Ultra160 HDDs to Ultra2 bus speeds.
3. Part numbers 36L9746 and 36L9750 are half-high devices and therefore cannot be utilized for configurations requiring greater than a quantity of seven.

Bay	Form Factor	Height	Front Access	Usage	Part Number	Description	RPM	Height	Bays Supported	Max. Qty.
-	89 mm (3.5")	SL	Yes	Diskette	**Ultra2 Hard Disk Drives (HDD)**					
-	133 mm (5.25")	HH	Yes	IDE CD-ROM	36L9744	Netfinity 9.1 GB Wide Ultra2 SCSI Hot-Swap SL HDD	7200	SL	See diagram	10
RM 1	133 mm (5.25")	HH[1]	Yes	Open	36L9745	Netfinity 18.2 GB Wide Ultra2 SCSI Hot-Swap SL HDD	7200	SL	See diagram	10
RM 2	133 mm (5.25")	HH[1]	Yes	Open	36L9746	Netfinity 36.4 GB Wide Ultra2 SCSI Hot-Swap HDD	7200	HH[2]	See diagram	7
1…10 or 1…7	HS	SL or HH[2]	Yes	Open	36L9748	Netfinity 9.1 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	10,000	SL	See diagram	10
NB3[3]	19" Rack	3U	Yes	Open	36L9749	Netfinity 18.2 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	10,000	SL	See diagram	10

1. Two half-high (HH) bays can be combined to support a single full-high (FH) device
2. The top bay is HH; all others are configured in groups of 3 SL bays. When a HH drive is installed in one of these groups, only another HH or a single SL drive can be installed in the same group. For clarity, the SCSI IDs are identified.
3. Tower configured systems (Netfinity 8Ux24D Rack-to-Tower Kit, P/N 37L6860 is required and includes a single NetBAY3) support installation of up to three NetBAY3s. See IBM Netfinity NetBAY3 Stackable Enclosure section for supported devices.

36L9750	Netfinity 36.4 GB 10K-3 Wide Ultra2 SCSI Hot-Swap HDD	10,000	HH[2]	See diagram	7
Ultra160 Hard Disk Drives (HDD)[1]					
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	See diagram	10
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	See diagram	10
37L7203	36.4 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	See diagram	10
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	See diagram	10
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	See diagram	10
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	See diagram	10
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	See diagram	10
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	See diagram	10



Netfinity NetBAY3 (NB3)
(Optional on Tower Configurations)

1. The top bay is HH; all others are configured in groups of three SL bays. When a HH drive is installed in one of these groups, only another HH or a single SL drive can be installed in the same group. For clarity, the SCSI IDs are identified.

	External Storage Expansion Units[3]	**Form Factor**
35301RU	Netfinity EXP200 Storage Expansion Unit[4]	Rack (3U)
37L5857	Netfiinity EXP200 Rack-to-Tower Conversion Kit	-
37L0075	Netfinity EXP200 350 W Redundant Power Supply	-
35311RU	EXP300 Storage Expansion Unit[5]	Rack (3U)
09N7296	EXP300 Rack-to-Tower Conversion Kit	-
35601RU	FAStT EXP500 Storage Expansion Unit[6]	Rack (3U)

1. Netfinity 7600 contains an Ultra2 hot-swap backplane which limits Ultra160 HDDs to Ultra2 bus speeds.
2. Two slim-line (SL) bays can be combined to support a single half-high (HH) device. See Bay diagram for identification of which bays can be combined. A mixture of HH, SL, 10,000 rpm and 7,200 rpm drives is supported.
3. Not supported by the onboard external SCSI port. Select an optional SCSI controller then refer to Appendix D: Cables-Storage Units-Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
4. Netfinity EXP200 includes a single 2 M Ultra2 SCSI cable and a single hot-swap 350 W power supply and power cord. Optional hot-swap Netfinity EXP200 350 W Redundant Power Supply (P/N 37L0075) includes an additional power cord. To convert an EXP200 to a tower form factor, Netfinity EXP200 Rack-to-Tower Conversion Kit (P/N 37L5857) is required.
5. EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500 W power supplies, each with its own power cord. To convert an EXP300 to a tower form factor, Netfinity EXP300 Rack-to-Tower Conversion Kit (P/N 09N7296) is required.
6. FAStT EXP500 Storage Expansion Unit (P/N 35601RU) includes dual hot-swap 350 W power supplies, each with its own power cord.

Netfinity 7600 Internal SCSI Cabling

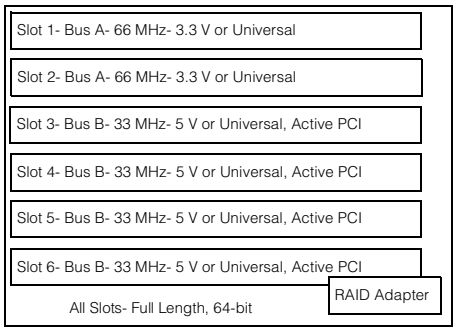
The Netfinity 7600 contains a DASD backplane supporting ten hot-swap, SCA-2 compliant drive bays. The backplane is connected to the internal connector of the standard ServeRAID Adapter through a 16-bit LVD SCSI cable. Models 8665-1…3RY contain a ServeRAID-3HB. All other models contain a ServeRAID-4M. External RAID support is provided through the two external 0.8-mm VHDCI connectors on the back of the adapter. Models using ServeRAID-4M for internal RAID may only utilize one of the external ports. To support SCSI devices in the internal 133/89-mm (5.25/3.5-inch) half-high bays, a two-drop, 16-bit LVD SCSI cable with integrated terminator is included with the server. This cable can be used to connect Channel B of the integrated Wide Ultra2 SCSI controller to SCSI devices in one or both of the removable media bays. Channel A, of the dual-channel, Wide Ultra2 SCSI controller, only supports external SCSI attachment and is cabled directly to an external 0.8-mm VHDCI SCSI connector.

Netfinity 7600 I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported[1]	Hot-Plug[2]	PCI Voltage Key	MHz
	Storage Controllers[3]						
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter[4]	Full	32/64-bit	3…6	X	5	33
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	3…6	-	5	33
37L6080	ServeRAID-4M Ultra160 SCSI Controller[5]	Full	32/64-bit	1…6	X	Universal	33
37L6889	ServeRAID-4H Ultra160 SCSI Controller[6]	Full	32/64-bit	1…6	X	Universal	33
19K4646	PCI Wide Ultra160 SCSI Adapter[17]	Half	32/64-bit	1…6	-	Universal	66
	Fiber Storage Controllers and Options[7]						
35261RU	Netfinity Fibre Channel RAID Controller Unit	-	-	-	-	-	-
01K7296	Netfinity Fibre Channel Failsafe RAID Controller	-	-	-	-	-	-
00N6881	Netfinity FAStT Host Adapter	Half	32/64-bit	1…6	X	Universal	66
35521RU	FAStT500 Storage Server	-	-	-	-	-	-
00N6883	Netfinity FAStT500 256 MB Cache	-	-	-	-	-	-
35421RU	FAStT200 Storage Server	-	-	-	-	-	-
35422RU	FAStT200 HA Storage Server	-	-	-	-	-	-
19K1121	FAStT200 Redundant RAID Controller	-	-	-	-	-	-
2108R3S	SAN Data Gateway Router (Single-Ended)	-	-	-	-	-	-
2108R3D	SAN Data Gateway Router (Differential)	-	-	-	-	-	-
2109S08	SAN Fibre Channel Switch, 8-port	-	-	-	-	-	-
2109S16	SAN Fibre Channel Switch, 16-port	-	-	-	-	-	-
	Networking[8]						
	Ethernet						
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1…6	X	Universal	33
09N9901	10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1…6	X	Universal	33
34L0301	Netfinity Gigabit Ethernet SX Adapter	Half	32/64-bit	1…6	X	Universal	33
	Token Ring						
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN[9]	Half	32-bit	1…6	X	Universal	33
34L5001	16/4 Token-Ring PCI Management Adapter[9]	Half	32-bit	1…6	X	Universal	33
34L5201	High-Speed 100/16/4 Token-Ring PCI Management Adapter	Half	32-bit	1…6	X	Universal	33
	Communications[10]						
33L4618	PCI V.90 56 Data/Fax Modem[11]	Half	32-bit	3…6	-	5	33
	Systems Management[12]						
01K7209	Netfinity Advanced System Management PCI Adapter[13]	Full	32-bit	3…6[14]	-	5	33
03K9309	Netfinity Advanced System Management Interconnect Cable Kit[15]	-	-	-	-	-	-
36L9654	Netfinity Advanced System Management Token-RIng Connection[16]	-	-	-	-	-	-
	Host Attach						
9086001	Netfinity ESCON Adapter[18]	Full	32-bit	3…6[19]	-	5	33

1.The 5 V slots support Universal or 5 V adapters. The 3.3 V slots support universal or 3.3 V adapters. A Universal keyed 66 MHz adapter plugged into a 33 MHz slot will operate at 33 MHz. A Universal keyed 33 MHz adapter plugged into a 66 MHz slot limits other adapters installed on the same bus to 33 MHz.
2. Slots 3-6 include hot-plug capability using IBM's Active PCI technology.
3. Models 8665 1…3xY include a single ServeRAID-3HB. Models 4xY and above include a single ServeRAID-4M. One channel of these adapters is attached to the internal hot-swap backplane. Remaining channels are available for external usage just as the option would be. All models include a dual-port, dual-channel, 64-bit Wide Ultra2 SCSI controller with one internal connector and one external port with a 0.8-mm Very High Density Connection Interface (VHDCI).
4. Netfinity ServeRAID-3HB Ultra2 SCSI Adapter (P/N 37L6086) provides one internal and 2 external (0.8-mm VHDCI) LVDS SCSI channels. The internal channel can be configured for external usage (0.8-mm VHDCI connector) providing a total of 3 external LVDS SCSI channels. Includes 32MB of mirrored battery-backup cache which helps protect against data loss in write-back cache mode in the event of a power outage or adapter maintenance.
5. ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two internal and two external Ultra160 connectors (only two connectors may be utilized). External connectors are 0.8-mm VHDCI.
6. ServeRAID-4H Ultra160 SCSI Controller is powered by a 266 MHz PowerPC 750 processor and provides 128 MB of battery-backed ECC cache with two internal and up to four external Ultra160 connectors (only four connectors may be utilized). External connectors are 0.8-mm VHDCI.
7. See Netfinity Fibre Array Solutions section for additional configuration information.
8. Netfinity 7600 includes a full-duplex, 10/100 Mbps Ethernet PCI Controller.
9. The Wake on LAN function of this option is not supported by this server.

10. Netfinity 7600 includes two USB ports, two high-speed serial/asynchronous ports (NS16550A compatible), and one high-speed (up to 2 MB/sec. data transfer speed) bi-directional parallel port supporting devices using ECP/EPP/SSP protocols adhering to the IEEE 1284 standard.
11. Due to homologation variances, modem availability may differ by country.
12. The Netfinity Advanced Systems Management Processor and Interconnect Bus integrated into Netfinity 7600 works with Netfinity Director to provide significant system management function. When used with optional Netfinity Advanced System Management PCI Adapter (P/N 01K7209) and Netfinity Advanced System Management Interconnect Cable Kit (P/N 03K9309) additional management and control of up to 12 service processors from a remote console through a single modem or LAN connection is possible.
13. Includes PCI adapter, Netfinity Advanced System Management Interconnect Cable Kit components and 56-watt AC adapter which requires a separate power source. Provides an integrated 10/100 Ethernet port and PCMCIA slot to support optional Netfinity Advanced System Management Token-Ring Connection (P/N 36L9654).
14. A maximum quantity of one is supported.
15. Required for all Netfinity servers containing a standard Advanced System Management Processor that are to be interconnected for system management support through a LAN or modem connection (Netfinity 5500 models 8660-1…4xU are not supported). Up to 12 service processors may be interconnected (including standard and optional processors) with an aggregate connection length of no more than 91.4 meters (300 ft.). A customer-supplied Ethernet cable is required for each interconnection.
16. Contains an IBM Turbo 16/4 Token-Ring PCI Card, which installs in the PCMCIA card slot of Netfinity Advanced System Management PCI Adapter, and a PC Card to 9-pin D-Shell cable which is routed to a rear chassis cut-out. The Netfinity Advanced System Management PCI Adapter's integrated Ethernet port and Netfinity Advanced System Management Token-Ring Connection cannot be connected or used together. To download the latest firmware access URL www.pc.ibm.com/us/netfinity. Select "Server Support", "Family", "Model", "Downloadable files", and finally "Advanced Systems Management".
17. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilized.
18. Provides an ESCON MIC and a DB9 Serial Port. Cables are not included but are available through S/390 channels. Contact your IBM representative for additional information.
19. A maximum of two 9086001 adapters (installed in non-adjacent slots) are supported in a single server.


Slot 1- Bus A- 66 MHz- 3.3 V or Universal
Slot 2- Bus A- 66 MHz- 3.3 V or Universal
Slot 3- Bus B- 33 MHz- 5 V or Universal, Active PCI
Slot 4- Bus B- 33 MHz- 5 V or Universal, Active PCI
Slot 5- Bus B- 33 MHz- 5 V or Universal, Active PCI
Slot 6- Bus B- 33 MHz- 5 V or Universal, Active PCI
All Slots- Full Length, 64-bit
RAID Adapter

Netfinity 7600 Power, Monitor & Accessories

Part Number	Description
	Power[1]
33L3760	250 W Hot-Swap Redundant Power Supply
	Uninterruptible Power Supply (UPS)[2]
94G3135	APC Smart-UPS 1000
94G3136	APC Smart-UPS 1400
94G6674	APC Smart-UPS 1400RMB[3]
94G6676	APC Smart-UPS 3000RMB[3]
37L6861	APC Smart-UPS 5000RMB[4]
	Monitors[5]
633347N	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
6331B2N	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
6332J1N	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[6]
66274AN	G78 Color Monitor 17" (454-mm, 17.9" Viewable Image Size), stealth black[6]
9511AG1	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable), stealth black[7]

1. Netfinity 7600 includes three 250W hot-swap redundant power supplies, with the ability to accept one additional 250 W Hot-Swap Redundant Power Supply
(P/N 33L3760. Each power supply includes its own 9-foot power cord for attachment to a low voltage UPS, PDU or wall outlet. To assist in determining when an additional power supply is required to preserve redundancy, a "Non-Redundant LED" is a standard feature of the Netfinity 7600. Predicting whether or not a particular configuration will require an additional power supply for redundancy is very complex. However, once the system is installed, the "Non-Redundant LED" will indicate when an additional power supply is required. The following sample configuration is provided as a reference.

Number of Power Supplies	System Configuration Supported
	Typical Redundant Configuration
3[8]	4 x Processors
	6 x PCI Adapters
	7 x Half-High or 10 Slim-Line HDDs
	16 x 512 MB RDIMMs
4	**Full Configuration with Redundancy**

2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
3. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
4. Height is 5U. See "Rack and NetBAY" for supported IBM racks.
5. Netfinity 7600 uses an SVGA controller (S3 Trio 3D chipset) with 4 MB of video memory.
6. Installation within a rack requires optional Monitor Compartment (P/N 94G7444).
7. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit II (P/N 37L6888) and Netfinity Rack Keyboard Tray (P/N 28L4707). A space saver keyboard may coexist within the same 28L4707 keyboard tray.
8. The addition of a DLT tape drive may require a fourth power supply to preserve redundancy.

Part Number	Description
	Conversion Kits
37L6860	8Ux24D Rack-to-Tower Kit[1]
	Rack and NetBAY[2]
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack
9306910	Netfinity Rack (includes perforated front door)
9306200	Netfinity NetBAY22
10L6912	Netfinity NetBAY3[3]
	Keyboard and Mouse[4]
28L3644	Space Saver II Keyboard[5, 7]
01K1260	TrackPoint IV 104-Key Black Keyboard[6,7]
28L3621	Preferred Keyboard (stealth black)[6]
28L3673	Sleek 2-Button Stealth Black Mouse

1. Includes one Netfinity NetBAY3 with casters.
2. Netfinity 7600 rack models are housed in a 19" rack mountable drawer and require one of the racks listed here. See IBM Netfinity Rack Cabinet and Options section for IBM rack supported devices.
3. Netfinity 7600 requires 8Ux24D Rack-to-Tower Kit (P/N 37L6860) for use with a NetBAY3. A maximum of three NetBAY3 enclosures, including the one which ships with the conversion kit, may be stacked beneath a supported Netfinity tower server. Optional NetBAY3s must be shipped separately and not while attached to the base configuration. See IBM Netfinity NetBAY3 Stackable Enclosure section for supported devices.
4. Netfinity 7600 ships without a keyboard or mouse.
5. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
6. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.
7. Advanced TrackPoint IV features are not available on IBM Netfinity systems.

Netfinity 7600 Tape Options

Part Number	Tape Drives	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive	1, 2	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	Y	N/A	3510020, 3551001[1]
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive	1, 2	16	133 mm (5.25") HH	N	N/A	3510020[2] 3551001
00N7990	40/80 GB DLT Internal SCSI Tape Drive	1/2	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	3503B0X[2], 3551001[1]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive	1, 2	16 Ultra2 LVD	133 mm (5.25") HH	N	N/A	3510020[2], 3551001[1]
	Tape Autoloaders						
3502108	DLT Tape Autoloader	N/A	16	Desktop	Y	N/A	-
00N7992	120/240GB DOS/4 Tape Autoloader	1/2	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	3551001[1]
	External Tape Libraries[3]						
3502x14	DLT Tape Library	-	16	Desktop or Rack	Y	-	-
	External Tape Enclosures						
3510020	External Half High SCSI Storage Enclosure[4]	-	8/16	Desktop	N	N	-
3503B0X	DLT External SCSI Enclosure[5]		16	Desktop	N	N	-
3551001	NetMEDIA Storage Expansion Unit EL[6]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[7]	-	16 LVD	-	N	N	3551001
	Associated Options						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	Ext.	Y	N	3510020, 3503B0X
10K2340	Media BayTray and LVD Cable Kit[8]	-	16 LVD	Int.	Y	N	3551001

Note: Netfinity 7600 includes a two-drop multimode terminated LVD SCSI cable, an available internal Ultra2 SCSI port and an external Ultra2 0.8-mm VHDCI connector.

1. LVD support for LVD devices requires installation of the 16-bit multi-mode terminated, two-drop, SCSI cable included with optional Media Bay Tray and LVD Cable Kit (P/N 10K2340).
2. Requires 68-pin External Multimode LVD/SE SCSI terminator (P/N 00N7956).
3. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
4. Provides a black desktop 133 mm (5.25") half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
5. Provides a black desktop DLT tape enclosure with a 68-pin high density external connector. Requires termination by the tape drive or by installation of an External Multimode LVD/SE SCSI terminator (P/N 00N7956).
6. NetMEDIA Storage Expansion Unit EL (P/N 3551001) is a black 3U, 19" rack or NetBAY3/3E mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included.
7. NetMEDIA Systems Management Adapter (P/N 10L7113) may be installed in a 3551001 to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the 3551001 is powered off. External connector is 0.8-mm VHDCI.
8. Media Bay Tray and LVD Cable Kit (P/N 10K2340) includes an internal two-drop multi-mode terminated LVD SCSI cable.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.

For a complete list of all IBM and non-IBM option compatibility with Network Operating Systems and IBM Netfinity Servers, access the ServerProven™ compatibility pages on the Web at URL www.ibm.com/pc/us/compat.

Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

High Availability Application Server

Part Number	Description	Quantity	Usage
8665-3RY	Netfinity 7600 700/2 MB Xeon, 512 MB(R) ECC,RAID, Open, 40X, PCI (Rack 8U)	1	-
33L3113	Netfinity 128 MB, 100 MHz ECC SDRAM RDIMM	4	-
33L3115	Netfinity 256 MB, 100 MHz ECC SDRAM RDIMM	4	-
33L3117	Netfinity 512 MB, 100 MHz ECC SDRAM RDIMM	4	4 GB Total System Memory
10K2332	Netfinity 700 MHz/2 MB Upgrade II with Pentium III Xeon Processor	3	Total of 4 SMP processors
36L9744	Netfinity 9.1 GB Wide Ultra2 SCSI Hot-Swap SL HDD	2	9.1 GB mirrored for NOS
36L9745	Netfinity 18.2 GB Wide Ultra2 SCSI Hot-Swap SL HDD	6	72 GB RAID 5 with Hot-Spare
00N7990	40/80 GB DLT Internal SCSI Tape Drive	1	-
33L3760	250 W Hot-Swap Redundant Power Supply	1	Full Power Redundancy
66274AN	G78 Color Monitor 17" (406.4 mm, 16" Viewable Image Size), stealth black	1	
28L3644	Space Saver II Keyboard	1	-
94G6674	APC Smart-UPS 1400RMB	1	-
External Storage			
35301RU	Netfinity EXP200 Storage Expansion Unit	1	Includes 2-m Ultra2 cable
37L0075	Netfinity EXP200 350 W Redundant Power Supply	1	-
36L9750	Netfinity 36.4 GB 10K-3 Wide Ultra2 SCSI Hot-Swap HDD	10	RAID 5 Data Storage with Hot-Spare
Rack			
9306200	Netfinity NetBAY22	1	
28L0542	Netfinity Console Server Selector Switch (4-port)	1	
94G6667	Power Cable- Type A14	1	
94G7447	NetBAY Console Cable Set 12 ft	1	
94G6670	Blank Filler Panel Kit	1	

This rack server is configured to act as the foundation for business critical applications, applications your business cannot afford to be without. Configured with enough disk drives to mirror the operating system and provide a standard RAID 5 environment for data, optional hot-swap redundant power and UPS for power even during a blackout, this server represents the leading edge in high availability. An internal tape drive is included to back up that all important asset…data. A modem could be included to allow out-of-band (non-LAN) system management utilizing the integrated Netfinity Advanced System Management Processor.

Server Consolidation

Part Number	Description	Quantity	Usage
8665-1RY	Netfinity 7600 550/1 MB Xeon, 512 MB(R) ECC, RAID, Open, 40X, PCI (Rack 8U)	1	-
33L3113	Netfinity 128 MB, 100 MHz ECC SDRAM RDIMM	4	1 GB Total System Memory
33L5057	Netfinity 550 MHz/1 MB Upgrade II with Pentium III Xeon Processor	1	Total of 2 SMP processors
36L9748	Netfinity 9.1 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	2	9.1 GB mirrored for NOS
36L9749	Netfinity 18.2 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	8	109 GB RAID 5 with Hot-Spare
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	3	Total of 4 Ethernet connections
00N7990	40/80 GB DLT Internal SCSI Tape Drive	1	-
66274AN	G78 Color Monitor 17" (406.4 mm, 16" Viewable Image Size), stealth black	1	
28L3644	Space Saver II Keyboard	1	-
94G6674	APC Smart-UPS 1400RMB	1	-
Rack			
9306200	Netfinity NetBAY22	1	-
28L0542	Netfinity Console Server Selector Switch (4-port)	1	-
94G6667	Power Cable - Type A14	1	Attaches to monitor
94G7447	NetBAYConsole Cable Set 12ft	1	-
94G6670	Blank Filler Panel Kit	2	-

This rack server is configured to meet the need of server consolidation. Many businesses are trying to get their arms around the dispersed departmental servers that have grown up around the enterprise. By moving multiple servers on to one platform there is only one system to manage, both hardware and software. There is potentially less expense for service, software licenses, etc., and there is no need to worry about putting all your eggs in one basket because the Netfinity 7600 is designed for high availability. This configuration includes 109 GB of internal HDD storage, features three power supplies which provide fully redundant power, a UPS to help protect the system against a momentary electricity loss, and an internal tape drive that backs up, up to 80 GB per tape…in addition to all the standard features of the Netfinity 7600.

IBM Netfinity 8500R Configurator

Part Number	Processor Speed (MHz)[2]	Number of Processors (Std./Max)	L2 ECC Cache (KB)	Memory (Std./Max) (R=RDIMM)	Form Factor	Power Supply Quantity (Std./Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor[3]	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std./Max)	CD-ROM (IDE)[4]	Bays (Total/Avail)	Slots (Total/Avail)
8681-4RY[1]	550	1/8	512	256 MB^{R}/32 GB	Rack (8U)	3/3	P, S, H, F	S-Fans, S-Power	Y	-	D, U2	2/0	0/72.8 GB	40X-17X	4/2	12/12
8681-5RY[1]	550	1/8	1024	512 MB^{R}/32 GB	Rack (8U)	3/3	P, S, H, F	S-Fans, S-Power	Y	-	D, U2	2/0	0/72.8 GB	40X-17X	4/2	12/12
8681-6RY[1]	550	1/8	2048	512 MB^{R}/32 GB	Rack (8U)	3/3	P, S, H, F	S-Fans, S-Power	Y	-	D, U2	2/0	0/72.8 GB	40X-17X	4/2	12/12
8681-7RY[1]	700	1/8	1024	512 MB^{R}/32 GB	Rack (8U)	3/3	P, S, H, F	S-Fans, S-Power	Y	-	D, U2	2/0	0/72.8 GB	40X-17X	4/2	12/12
8681-8RY[1]	700	1/8	2048	512 MB^{R}/32 GB	Rack (8U)	3/3	P, S, H, F	S-Fans, S-Power	Y	-	D, U2	2/0	0/72.8 GB	40X-17X	4/2	12/12

1. Housed in a 19" Rack mountable drawer and ships standard without a keyboard or mouse. See "Rack and NetBAY" under "Netfinity 8500R Power, Monitor & Accessories" for supported IBM racks.
2. Intel Pentium III Xeon processor.
3. Netfinity 8500R includes a systems management adapter equivalent to the one shipped with option 01K7209 (Netfinity Advanced System Management PCI Adapter).
4. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.

Netfinity 8500R Processor Upgrades

Part Number	Processor Upgrades with 512 KB, 1 MB or 2 MB Cache[1]	SMP Support[2]	Processor Speed/Cache Upgrade[3]
33L5103	Netfinity 8500R 550 MHz/512 KB Upgrade with Pentium III Xeon Processor	4RY	-
33L5104	Netfinity 8500R 550 MHz/1 MB Upgrade with Pentium III Xeon Processor	5RY	4RY
33L5105	Netfinity 8500R 550 MHz, 2 MB Upgrade with Pentium III Xeon Processor	6RY	4…5RY
28L4730	Netfinity 8500R>4-Way Enablement Kit (1X SRAM)	4…6RY[4]	4…6RY
28L4727	Netfinity 8500R>4-Way Enablement Kit (4X SRAM)	4…6RY[4]	4…6RY
10K2330	Netfinity 8500R 700 MHz/1 MB Upgrade with Pentium III Xeon Processor	7RY	4…6RY[5]
10K2166	Netfinity 8500R 700 MHz/2 MB Upgrade with Pentium III Xeon Processor	8RY	4…7RY[5]
10K2335	Netfinity 4X Accelerator Filter	7…8RY[4]	4…7RY
10K2337	Netfinity Mezzanine Expansion Kit	7…8RY[4]	4…7RY

1. Netfinity 8500R architecture optimizes memory and bus performance using a 100 MHz, five-port crossbar core chipset. Up to eight Pentium III Xeon processors are supported on two 100 MHz P-6 CPU buses. The recommended order of processor installation is: Sockets A1, A3, A2, A4, B1, B3, B2, B4.
2. Up to seven additional processors may be installed, providing a maximum of eight. All processors must be identical in type, speed, and cache size.
3. Requires removal of the standard processor(s). A maximum of eight processors may be installed. Installation of greater than four processors requires the addition of a mezzanine board and two cache coherency filters. Required options which provide the board and filters vary by model. For more information refer to "Processor Upgrade Requirements". All processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".
4. See "Processor Upgrade Requirements" to determine when this option is required.
5. Replacement of the standard processor mezzanine board and the mezzanine board from any installed enablement kit of 550 MHz models is required. See "Processor Upgrade Requirements" to determine specific model upgrade requirements.

Processor Upgrade Requirements[1, 2]

	Upgrade To			
Upgrade From	≤ 4 x 550 MHz processors	> 4 x 550 MHzprocessors	≤ 4 x 700 MHzprocessors	> 4 x 700 MHz processors
≤ 4 x 550 MHz processors	-	1 x 28L4730 or 1 x 28L4727	1 x 10K2337[3]	1 x 10K2335, 2 x 10K2337[3]
> 4 x 550 MHzprocessors	n/a	-	1 x 10K2337[3, 4]	2 x 10K2337[3, 5]
≤ 4 x 700 MHz processors	n/a	n/a	-	1 x 10K2335, 1 x 10K2337

1. This table does not address the processor part numbers required. It does address the optional Enablement Kit, Filters, and Mezzanine Board part numbers required.
2. All processors must be identical in type, speed, and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" then "BIOS".
3. Remove the standard processor mezzanine board.
4. Remove all optional Enablement Kit components.
5. Remove Enablement Kit mezzanine board. The Enablement Kit 4X cache coherency filters are supported for use with Netfinity Mezzanine Expansion Kit P/N 10K2337.

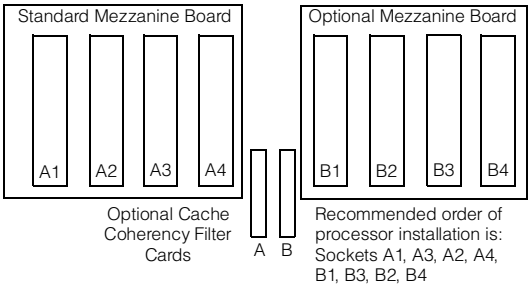
Netfinity 8500R ships with a single mezzanine board containing four Pentium III Xeon processor sockets with terminators in the unoccupied sockets. An additional mezzanine board may be added, expanding the number of processor sockets to eight. The two mezzanine boards are then linked through two cache coherency filter cards, one for each mezzanine board.

Option Content

Netfinity 8500R > 4-Way Enablement Kits
(P/N 28L4730 and P/N 28L4727)
- Support for 550 MHz models only
- Required for installation of processors 5…8.
- One Processor Mezzanine Board
- Two cache coherency filter modules
  - 28L4730 economical 1X (256 K entries)
  - 28L4727 high performance 4X (1 M entries)
  - Filters may be used with Mezzanine Expansion Kit (P/N 10K2337)

Netfinity 4X Accelerator Filter (P/N 10K2335)
- Two cache coherency filter modules
- Requires Mezzanine Kit 10K2337

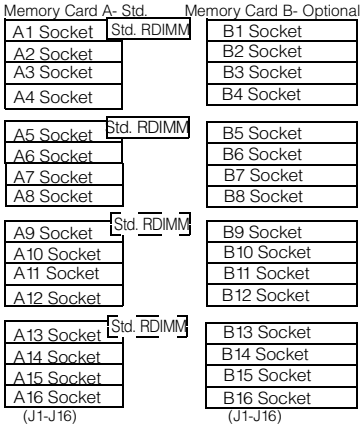
Netfinity Mezzanine Expansion Kit (P/N 10K2337)
- One Processor Mezzanine Board
- Supports cache coherency filters from the following options:
  - P/N 10K2335
  - P/N 28L4730
  - P/N 28L4727
- Supports 700 MHz and above processors only
- Required when upgrading models 8681-4RY…6RY to 700 MHz or above



All installed processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" then "BIOS".

Netfinity 8500R Memory

Total System Memory[1]		Quantity of RDIMMs Added			
Standard Models					
256 MB (2 x 128)	512 MB (4 x 128)	128 MB (20L0245)	256 MB (20L0247)	512 MB (20L0249)	1 GB (33L3056)
384	640	1	-	-	-
512	768	2 or	1	-	-
768	1024	4 or	2 or	1	-
1024	1280	6 or	3	-	-
1280	1536	8 or	4 or	2 or	1
1536	1792	10 or	5	-	-
1792	2048	12 or	6 or	3	-
2304	2560	16[2] or	8 or	4 or	2
2560	2816	18[2] or	9	-	-
2816	3072	20[2] or	10 or	5	-
3072	3328	22[2] or	11	-	-
3328	3584	24[2] or	12 or	6 or	3
3840	4096	28[2] or	14[4] or	7	-
4096	-	30[2] or	16[3]	-	-
4352	4608	-	16[2] or	8 or	4
4864	5120	-	18[2] or	9	-
5376	5632	-	20[2] or	10 or	5
5888	6144	-	22[2] or	11	-
6400	6656	-	24[2] or	12 or	6
7424	7680	-	28[2] or	14[4] or	7
8192	8192	-	32[2, 3] or	16[3] or	8[3]
8448	8704	-	-	16[2] or	8
9472	9728	-	-	18[2] or	9
10496	10752	-	-	20[2] or	10
11520	11776	-	-	22[2] or	11
12544	12800	-	-	24[2] or	12
13568	13824	-	-	26[2] or	13
14592	14848	-	-	28[2] or	14[4]
15488	15488	-	-	-	15[6]



Recommended order of RDIMM population for optimum cooling: 1, 5, 9, 13, 3, 7, 11, 15, 2, 6, 10, 14, 4, 8, 12, 16.

16384	16384	-	-	32[2, 3] or	16[3]
16640	16896	-	-	-	16[2]
18688	18944	-	-	-	18[2]
20736	20992	-	-	-	20[2]
22784	23040	-	-	-	22[2]
24832	25088	-	-	-	24[2]
26880	27136	-	-	-	26[2]
28928	29184	-	-	-	28[2]
30720	30720	-	-	-	30[5]
32768	32768	-	-	-	32[3]

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller RDIMMs may provide a more cost-effective alternative to using larger RDIMMs.

NOTE: Cache line interleaving may be enabled by installing Netfinity 8500R Memory Expansion Card (P/N 28L4454) with as few as two RDIMMs. Matched pairs must be installed if the memory expansion card is present.
1. Network Operating Systems may limit the maximum amount of addressable memory. See the operating system specifications for further information.
2. Netfinity 8500R Memory Expansion Card (P/N 28L4454) is required for installation of greater than 16 RDIMMs.
3. Requires removal of standard memory.
4. Models with 4 x 128 RDIMMs standard require Netfinity 8500R Memory Expansion Card (P/N 28L4454) for installation of greater than 16 RDIMMs.
5. Requires removal of all but two of the standard RDIMMs.
6. Requires removal of all but one of the standard RDIMMs.

Part Number	Memory Description[1]
20L0245	Netfinity 128 MB SDRAM ECC RDIMM II
20L0247	Netfinity 256 MB SDRAM ECC RDIMM II
20L0249	Netfinity 512 MB SDRAM ECC RDIMM II
28L4454	Netfinity 8500R Memory Expansion Card[2]
33L3056	Netfinity 1 GB SDRAM ECC RDIMM II

1. Netfinity 8500R includes a single memory card with the ability to support up to 16 GB of memory. Model 8681-4RY contains two RDIMMs standard, other models contain four. For memory installation of greater than 16 GB, Netfinity 8500R Memory Expansion Card (P/N 28L4454) is required. Installation of memory on systems containing a single memory card (standard on all models) has no restrictions on size or placement. When Netfinity 8500R Memory Expansion Card (P/N 28L4454) is installed, the memory RDIMM in each socket of Card A must match the RDIMM in the same socket on Card B. To enable cache line interleaving, both memory cards must be installed and configured identically.
2. Required for enablement of cache line interleaving or installation of greater than 16 RDIMMs. Configuration of the standard memory card (Card A) and optional 28L4454 (Card B) must be identical.

Netfinity 8500R Hard Disk Drive (HDD) Storage

Total Internal Storage[1]	7200 RPM Hard Disk Drives (HDDs)			10,000 RPM HDDs		
	9.1 GB (P/N 36L9744 or 37L7201)[2]	18.2 GB (P/N 36L9745 or 37L7202)[2]	36.4 GB (P/N 36L9746 or 37L7203)[2]	9.1 GB (P/N 36L9748 or 37L7204)[2]	18.2 GB (P/N 36L9749 or 37L7205)[2]	36.4 GB (P/N 36L9750 or 37L7206)[2]
0 GB	Standard on Base Models			Standard on Base Models		
9.1 GB	1	-	-	1	-	-
18.2 GB	2	1	-	2	1	-
36.4 GB	-	2	1	-	2	1
72.8 GB (max)	-	-	2	-	-	2

This table does not represent all possible hard drive configurations.
1. Select a total storage row and then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within ± 0.2 GB unless otherwise noted.
2. Netfinity 8500R contains an Ultra2 hot-swap backplane which limits Ultra160 HDDs to Ultra2 bus speeds.

Bay	Form Factor	Height	Front Access	Usage
-	133 mm (5.25")	HH	Yes	IDE CD-ROM
-	89 mm (3.5")	SL	Yes	Diskette
1...2	HS	HH	Yes	Open
NB3E[1]	19" Rack	3U	Yes	Open

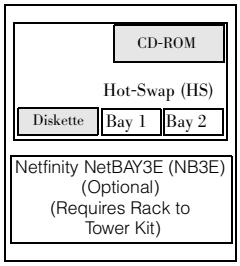
Part Number	Description	RPM	Height	Bays Supported	Max Qty.
	Ultra2 Hard Disk Drives (HDD)				
36L9744	Netfinity 9.1 GB Wide Ultra2 SCSI Hot-Swap SL HDD	7200	SL	1, 2	2
36L9745	Netfinity 18.2 GB Wide Ultra2 SCSI Hot-Swap SL HDD	7200	SL	1, 2	2
36L9746	Netfinity 36.4 GB Wide Ultra2 SCSI Hot-Swap HDD	7200	HH	1, 2	2

36L9748	Netfinity 9.1 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	10000	SL	1, 2	2
36L9749	Netfinity 18.2 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	10000	SL	1, 2	2
36L9750	Netfinity 36.4 GB 10K-3 Wide Ultra2 SCSI Hot-Swap HDD	10000	HH	1, 2	2
	Ultra160 Hard Disk Drives (HDD)[1]				
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1, 2	2
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1, 2	2
37L7203	36.4 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1, 2	2
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1, 2	2
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1, 2	2
37L7206	36.4 GB 10-K Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1, 2	2
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	1, 2	2
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	1, 2	2

	External Storage Expansion Units[2]	**Form Factor**
35301RU	Netfinity EXP200 Storage Expansion Unit[3]	Rack (3U)
37L5857	Netfinity EXP200 Rack-to-Tower Conversion Kit	Tower
37L0075	Netfinity EXP200 350 W Redundant Power Supply	-
35311RU	EXP300 Storage Expansion Unit[4]	Rack (3U)
09N7296	EXP300 Rack-to-Tower Conversion Kit	-
35601RU	FAStT EXP500 Storage Expansion Unit[5]	Rack (3U)

1. Netfinity 8500R contains an Ultra2 hot-swap backplane which limits Ultra160 HDDs to Ultra2 bus speeds.
2. Not supported by the onboard external SCSI port. Select an optional SCSI controller then refer to Appendix D: Cables-Storage Units-Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
3. Netfinity EXP200 includes a single 2 M Ultra2 SCSI cable and a single hot-swap 350W power supply and power cord. Optional hot-swap Netfinity EXP 350 W Redundant Power Supply (P/N 37L0075) includes an additional power cord. To convert and EXP200 to a tower form factor, Netfinity EXP200 Rack-to-Tower Conversion Kit (P/N 09N7296) is required.
4. EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500 W redundant power supplies, each with its own power cord. To convert an EXP300 to a tower form factor, Netfinity EXP300 Rack-to-Tower Conversion Kit (P/N 09N7296) is required.
5. FAStT EXP500 Storage Expansion Unit (P/N 35601RU) includes dual hot-swap 350 W power supplies, each with its own power cord.

1. A total of three optional 3U NetBAY3Es can be stacked beneath a Netfinity 8500R which has Netfinity 8Ux28D Rack-to-Tower Kit (P/N 28L4705) installed. See IBM Netfinity NetBAY3x Stackable Enclosure section for supported devices.



Internal SCSI Cabling

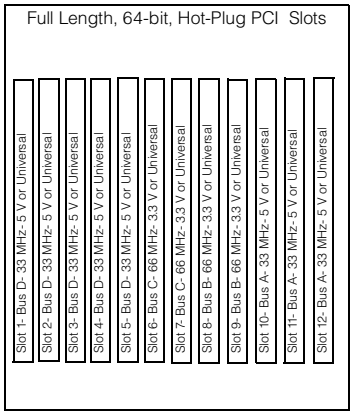
Netfinity 8500R systems contains an LVDS backplane supporting two hot-swap drive bays that support installation of up to two 3.5-inch, slim-high or half-high HDDs. The backplane is connected to the internal Wide Ultra2 SCSI controller through a 16-bit LVD SCSI cable. RAID support for the internal hot-swap drive bays is provided by adding a supported RAID adapter and moving the standard SCSI cable from the onboard controller to the optional RAID controller. The standard external Wide Ultra2 SCSI port uses a 0.8-mm Very High Density Connector Interface (VHDCI). .

Netfinity 8500R I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported[1]	Hot-Plug[2]	PCI Voltage Key	MHz
	Storage Controllers[3]						
19K0564	Netfinity ServeRAID-3L Ultra2 SCSI Adapter II[4]	Full	32-bit	(1…5, 10…12)[8]	X	5	33
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter[5]	Full	32/64-bit	(1…5, 10…12)[8]	X	5	33
37L6080	ServeRAID-4M Ultra160 SCSI Controller[6]	Full	32/64-bit	1…12	X	Universal	33
37L6889	ServeRAID-4H Ultra160 SCSI Controller[7]	Full	32/64-bit	1…12	X	Universal	33
19K4646	PCI Wide Ultra160 SCSI Adapter[10]	Half	32/64-bit	1…12	-	Universal	66
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	1…5, 10…12	-	5	33
	Fibre Storage Controllers and Options[9]						
35261RU	Netfinity Fibre Channel RAID Controller Unit	-	-	-	-	-	-
01K7296	Netfinity Fibre Channel Failsafe RAID Controller	-	-	-	-	-	-

00N6881	Netfinity FAStT Host Adapter	Half	32/64-bit	1…12	X	Universal	66
35521RU	FAStT500 Storage Server	-	-	-	-	-	-
35421RU	FAStT200 Storage Server	-	-	-	-	-	-
35422RU	FAStT200 HA Storage Server	-	-	-	-	-	-
19K1121	FAStT200 Redundant RAID Controller	-	-	-	-	-	-
35341RU	SAN Fibre Channel Managed Hub	-	-	-	-	-	-
2108R3S	SAN Data Gateway Router (Single-Ended)	-	-	-	-	-	-
2108R3D	SAN Data Gateway Router (Differential)	-	-	-	-	-	-
2109S08	SAN Fibre Channel Switch, 8-Port	-	-	-	-	-	-
2109S16	SAN Fibre Channel Switch, 16-Port	-	-	-	-	-	-
	Networking[11]						
	Ethernet						
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1…12	X	Universal	33
09N9901	10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1…12	X	Universal	33
34L0301	Netfinity Gigabit Ethernet SX Adapter	Half	32/64-bit	1…12	X	Universal	33
	Token Ring						
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN[13]	Half	32-bit	1…12	X	Universal	33
34L5001	16/4 Token-Ring PCI Management Adapter[13]	Half	32-bit	1…12	X	Universal	33
34L5201	High-Speed 100/16/4 Token-Ring PCI Management Adapter	Half	32-bit	1…12	-	Universal	33
	Communications[14]						
33L4618	PCI V.90 56 Data/Fax Modem[15]	Half	32-bit	1…5, 10…12	-	5	33
37L14xx	Serial I/O SST 8, 16 and 128 Port Adapters[16]	Half	32-bit	(1…5, 10…12)[16]	-	5	33
	Systems Management[17]						
03K9309	Netfinity Advanced Systems Management Interconnect Cable Kit[18]	-	-	-	-	-	-
36L9654	Netfinity Advanced System Management Token-Ring Connection[19]	-	-	-	-	-	-
02K6545	UltraSlim 56 W AC Adapter[20]	-	-	-	-	-	-
	Host Attach						
9086001	Netfinity ESCON Adapter[21]	Full	32-bit	(1…5, 10…12)[22]	-	5	33

1. The P-6 I/O bus supports four independent 64-bit PCI buses, two of which drive eight 33 MHz, 5.0 V slots (1-5, 10-12), while the other two buses drive four 66 MHz, 3.3 V slots (6-9). The 5 V slots support Universal or 5 V adapters. A 66 MHz adapter plugged into these slots will operate at 33 MHz. The 3.3 V slots support Universal or 3.3 V adapters. A 33 MHz adapter plugged into these slots limits a 66 MHz PCI adapter installed on the same bus to 33 MHz.
2. All 12 Slots are hot-plug capable using IBM's Active PCI technology. For Network Operating System support access URL www.ibm.com/pc/us/compat.
3. Netfinity 8500R includes a dual-port, dual-channel, 64-bit Wide Ultra2 SCSI controller which supports either Single Ended (SE) or Low Voltage Differential SCSI (LVDS) modes. One internal connector and one external port with a 0.8-mm Very High Density Connection Interface (VHDCI) are standard. The internal LVD SCSI cable has sufficient length to attach to an adapter located in slots 10…12. If a boot device (internal or external) is to be attached to an adapter, the adapter must reside in slots 10…12 due to BIOS scanning sequences.
4. Netfinity ServeRAID-3L Ultra2 SCSI Adapter II (P/N 19K0564) provides either one internal or one external (0.8-mm VHDCI) LVDS SCSI channel. Netfinity ServeRAID-3L Ultra2 SCSI Adapter II (P/N 19K0564) is a planned replacement for P/N 01K7364.
5. Netfinity ServeRAID-3HB Ultra2 SCSI Adapter (P/N 37L6086) provides one internal and two external (0.8 mm VHDCI) LVDS SCSI channels. The internal channel can be configured for external usage (0.8 mm VHDCI) providing a total of three external LVDS SCSI channels. Includes 32 MB of mirrored battery-backup cache, which helps protect against data loss in write-back cache mode in the event of a power outage or adapter maintenance.
6. ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two internal and two external Ultra160 connectors (only two connectors may be utilized). External connectors are 0.8-mm VHDCI.
7. ServeRAID-4H Ultra160 SCSI Controller is powered by a 266 MHz PowerPC 750 processor and provides 128 MB of battery-backed ECC cache with two internal and up to four external Ultra160 connectors (only four connectors may be utilized). External connectors are 0.8-mm VHDCI.
8. A total quantity of eight, in any combination of 01K7363, 19K0564, 37L6086, and 01K7207 is supported.
9. See Netfinity Fibre Array Solutions section for additional configuration information.
10. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilized.
11. Netfinity 8500R does not include an onboard network controller.
12. Early versions of Token-Ring 16/4 PCI Adapter 2 (P/N 34L0601) were keyed as Universal; current versions are keyed for 5 V. All versions are supported in 5 V PCI slots only.
13. The Wake on LAN function of this option is not supported by this server.
14. Netfinity 8500R includes two USB ports, two high-speed serial/asynchronous ports, (NS 16550A compatible), and one high-speed (up to 2 MBps data transfer speed) bi-directional parallel port supporting devices using ECP/EPP/SSP protocols adhering to the IEEE 1284 standard.
15. Due to homologation variances, modem availability may differ by country.
16. See Appendix E for details on Serial I/O options and configuration limitations. A maximum of four Serial I/O adapters (any combination of P/N 37L1414, 37L1415, 37L1416, 37L1423) may be installed.
17. Netfinity 8500R ships standard with a Netfinity Advanced System Management PCI Adapter.
18. Required for all xSeries and Netfinity Servers containing a standard Advanced System Management Processor that are to be interconnected for system management support through a LAN or modem connection (Netfinity 5500 models 8660-1…4xU are not supported). Up to 12 service processors may be interconnected (including standard and optional processors) with an aggregate connection length of no more than 91.4 meters (300 ft). A customer-supplied Ethernet cable is required for each interconnection.
19. Contains an IBM Turbo 16/4 Token-Ring PCI Card, which installs in the PCMCIA card slot of Netfinity Advanced System Management PCI Adapter and a PC Card to 9-pin D-Shell cable which is routed to a rear chassis cut-out. The Netfinity Advanced System Management PCI Adapter's integrated Ethernet port and Netfinity Advanced System Management Token-Ring Connection cannot be connected or used together. To download the latest firmware, access URL www.ibm.com/pc/us/netfinity. Select "Server Support", "Family", "Model", "Downloadable Files" and finally "Advanced System Management".
20. Although the 8500R integrated Netfinity System Management PCI Adapter is powered continuously through the redundant power supply subsystem, an even higher level of availability is offered with the addition of UltraSlim 56 W AC Adapter by allowing an independent power source or connection to a separate optional UPS.
21. Provides an ESCON MIC and DB9 Serial Port. Cables are not included but are available through S/390 channels. Contact your IBM representative for additional information.
22. A maximum of two 9086001 adapters (installed in non-adjacent slots) are supported in a single server. Where possible, install in a minimally loaded bus.


Full Length, 64-bit, Hot-Plug PCI Slots
Slot 1- Bus D- 33 MHz- 5 V or Universal
Slot 2- Bus D- 33 MHz- 5 V or Universal
Slot 3- Bus D- 33 MHz- 5 V or Universal
Slot 4- Bus D- 33 MHz- 5 V or Universal
Slot 5- Bus D- 33 MHz- 5 V or Universal
Slot 6- Bus C- 66 MHz- 3.3 V or Universal
Slot 7- Bus C- 66 MHz- 3.3 V or Universal
Slot 8- Bus B- 66 MHz- 3.3 V or Universal
Slot 9- Bus B- 66 MHz- 3.3 V or Universal
Slot 10- Bus A- 33 MHz- 5 V or Universal
Slot 11- Bus A- 33 MHz- 5 V or Universal
Slot 12- Bus A- 33 MHz- 5 V or Universal

Netfinity 8500R Power, Monitor & Accessories

Part Number	Description
	Power[1]
	Uninterruptible Power Supply (UPS)[2]
94G6676	APC Smart-UPS 3000RMB[3]
37L6861	APC Smart-UPS 5000RMB[4]
	Monitors[5]
633347N	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
6331B2N	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
6332J1N	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[6]
66274AN	G78 Color Monitor 17" (454-mm, 17.9" Viewable Image Size), stealth black[6]
9511AG1	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable), stealth black[7]

1.Netfinity 8500R systems contain three 750 W (at 220 V), hot-swap power supplies which handle robust configurations while providing full redundancy. When operating at 110 V, redundancy is limited to configurations not exceeding six processors, 24 memory RDIMMs, or eight PCI adapters. Each system ships with 9 power cords: 3 x 220 V, 3 x 110 V, 3 x intra-rack 220 V. Even though multiple UPSs may provide redundant power sources, systems management software does not currently take advantage of its power outage alerts.
2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimates.
3. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
4. Height is 5U. See "Rack and NetBAY" for supported IBM racks.
5. Netfinity 8500R uses an SVGA controller (S3 Trio 3D chipset) with 4 MB of video memory.
6. Installation within a rack requires optional Monitor Compartment (P/N 94G7444).
7. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit II (P/N 37L6888) and Netfinity Rack Keyboard Tray (P/N 28L4707). A space saver keyboard may coexist within the same 28L4707 keyboard tray.

Part Number	Description
	Conversion Kits
28L4705	8Ux28D Rack-to-Tower Kit[1]
	Rack and NetBAY[2]
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack[3]
9306910	Netfinity Rack (includes perforated front door)
36L9703	Netfinity Rack Extension Kit
9306200	Netfinity NetBAY22[4]
36L9702	NetBAY22 Rack Extension Kit
36L9701	Netfinity NetBAY3E[5]

Keyboard and Mouse[6]	
28L3644	Space Saver II Keyboard[7, 8]
01K1260	TrackPoint IV 104-Key Black Keyboard[8, 9]
28L3621	Preferred Keyboard (stealth black)[9]
28L3673	Sleek 2-Button Stealth Black Mouse

1. Includes one Netfinity NetBAY3E with casters.
2. Netfinity 8500R is housed in a 19" rack mountable drawer and requires one of the racks listed here. See "IBM Netfinity Rack Cabinet and Options" section for IBM rack supported devices.
3. Netfinity Rack Extension Kit (P/N 36L9702) is required for proper rear door closure clearance.
4. NetBAY22 Rack Extension Kit (P/N 36L9703) is required for proper rear door closure clearance.
5. A maximum of three NetBAY3E enclosures may be stacked beneath a supported Netfinity tower server (Rack-to-Tower Kit28L4705 required). Optional NetBAY3Es must be shipped separately and not while attached to the base configuration. See IBM Netfinity NetBAY3X Stackable Enclosure section for supported devices.
6.Netfinity 8500R ships without a keyboard or mouse.
7. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
8. Advanced TrackPoint IV features are not available on IBM Netfinity systems.
9. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.

Netfinity 8500R Tape Options

Part Number	Tape Drives	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive	N/A	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	Y	N/A	3510020, 3551001[1]
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive	N/A	16	133 mm (5.25") HH	N	N/A	3510020[2], 3551001
09N4040	20/40GB DLT Internal SCSI Tape Drive	N/A	8	133 mm (5.25") FH	N	Y	3503B0X[2], 3551001
00N7990	40/80 GB DLT Internal SCSI Tape Drive	N/A	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	3503B0X[2], 3551001[1]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive	N/A	16 Ultra2 LVD	133 mm (5.25") HH	N	N/A	3510020[2], 3551001[1]
	Tape Autoloaders						
3502108	DLT Tape Autoloader	N/A	16	Desktop	Y	N/A	-
00N7992	120/240GB DDS/4 Tape Autoloader	N/A	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	3551001[1]
	External Tape Libraries[3]						
3502x14	DLT Tape Library	-	16	Desktop or Rack	Y	-	-
3570C2x	Magstar MP 3570 Tape Subsystem		Diff.	6U Rack	Y	N	-
	External Tape Enclosures						
3510020	External Half High SCSI Storage Enclosure[4]	-	8/16	Desktop	N	N	-
3503B0X	DLT External SCSI Enclosure[5]		16	Desktop	N	N	-
3551001	NetMEDIA Storage Expansion Unit EL[6]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[7]	-	16 LVD	-	N	N	3551001
	Associated Options						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	Ext.	Y	N	3510020, 3503B0X
10K2340	Media BayTray and LVD Cable Kit[8]	-	16 LVD	Int.	Y	N	3551001

Note: Netfinity 8500R does not support internal tape drives but does include an external Ultra2 0.8-mm VHDCI SCSI connector for attachment of an external tape or tape enclosure. All tape drives and enclosures are also supported by PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which has an external 0.8-mm VHDCI connector. Select tape drive, enclosure and controller then use Appendix D: Cables-Storage Units-Controllers to select an appropriate external cable

1. LVD support for LVD devices requires installation of the 16-bit multi-mode terminated, two-drop, SCSI cable included with optional Media Bay Tray and LVD Cable Kit (P/N 10K2340).
2. Requires 68-pin External Multimode LVD/SE SCSI terminator (P/N 00N7956).
3. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
4. Provides a black desktop 133 mm (5.25") half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
5. Provides a black desktop DLT tape enclosure with a 68-pin high density external connector. Requires termination by the tape drive or by installation of an External Multimode LVD/SE SCSI terminator (P/N 00N7956).
6. NetMEDIA Storage Expansion Unit EL (P/N 3551001) is a black 3U, 19" rack or NetBAY3/3E mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included.
7. NetMEDIA Systems Management Adapter (P/N 10L7113) may be installed in a 3551001 to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the 3551001 is powered off. External connector is 0.8-mm VHDCI.
8. Media Bay Tray and LVD Cable Kit (P/N 10K2340) includes an internal two-drop multi-mode terminated LVD SCSI cable.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.

Sample Configurations

The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

High Availability-Rack

Part Number	Description	Quantity	Usage
8681-6RY	Netfinity 8500R (PIII Xeon 550/2MB 512MB/Rack) (8U)	1	Power Redundancy standard
33L5105	Netfinity 8500R 550 MHz/2 MB Upgrade with Pentium III Xeon Processor	5	Total of 6 SMP processors
28L4727	Netfinity 8500R>4-Way Enablement Kit (4X SRAM)	1	Required for greater than 4 processors
20L0247	Netfinity 256 MB SDRAM ECC RDIMM II	8	Total of over 2 GB of memory
28L4454	Netfinity 8500R Memory Expansion Card	1	Enables cache line interleaving
36L9744	Netfinity 9.1 GB Wide Ultra2 SCSI Hot-Swap SL HDD	2	NOS mirroring
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter	1	RAID Controller - NOS plus EXP200
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	1	-
6331B2N	E54 Color Monitor 15" (350 mm, 13.8" Viewable Image Size), stealth black	1	-
28L3644	Space Saver II Keyboard	1	-
94G6676	APC Smart-UPS 3000RMB	1	-
	External Storage		
3551001	NetMEDIA Storage Expansion Unit EL	1	External Tape Drive Enclosure
00N7990	40/80 GB DLT Internal SCSI Tape Drive	2	Installs in 3551001
35301RU	Netfinity EXP200 Storage Expansion Unit	1	Provides additional 10 bays
37L0075	Netfinity EXP200 350 W Redundant Power Supply	1	-
03K9311	Netfinity 4.2 M Ultra2 SCSI Cable	2	Tape to Onboard SCSI, 3-HB to EXP200
36L9748	Netfinity 9.1 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	6	RAID 5 with Hot-Spare in EXP200
	Rack Options		
9306200	Netfinity NetBAY22	1	Monitor and keyboard mount on top
36L9702	NetBAY22 Rack Extension Kit	1	Required for rear door closure
94G6667	Power Cable - Type A14 (4)	5	-
94G6670	Blank Filler Panel Kit	1	-

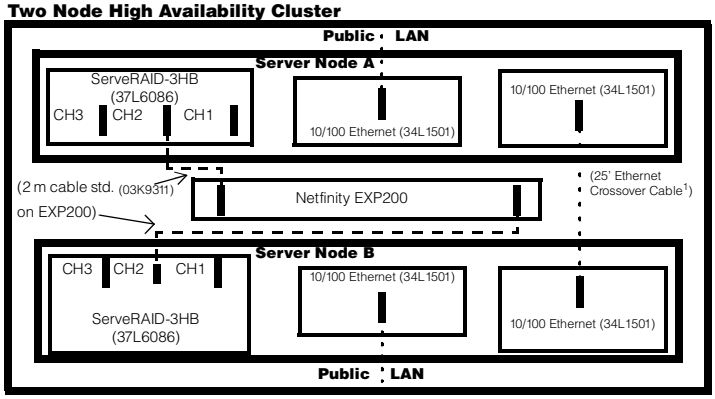
This high availability server is configured to act as the foundation for business critical applications, applications your business cannot afford to be without. The configuration includes enough disk drives to mirror the operating system and provide a RAID 5 data environment, power supply redundancy by the server and EXP200 and a UPS for power even during a blackout. A rack mounted tape drive is included to back up that all important asset…data. This server represents the leading edge in high availability.

Notes/Exchange-Stack

Part Number	Description	Quantity	Usage
8681-7RY	Netfinity 8500R 700/1MB, 512MB ECC, OPEN, 40X, PCI (Rack 8U)	1	Power redundancy standard
10K2330	Netfinity 8500R 700 MHz/1 MB Upgrade with Pentium III Xeon Processor	5	Total of 6 SMP processors
10K2335	Netfinity 4X Accelerator Filter	1	Required for greater than 4 processors
10K2337	Netfinity Mezzanine Expansion Kit	1	Required for greater than 4 processors
20L0249	Netfinity 512 MB SDRAM ECC RDIMM II	3	Total of 2 GB of memory
28L4454	Netfinity 8500R Memory Expansion Card	1	Enables cache line interleaving
36L9744	Netfinity 9.1 GB Wide Ultra2 SCSI Hot-Swap SL HDD	2	NOS Mirroring
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	1	-
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter	1	NOS plus EXP200
6331B2N	E54 Color Monitor 15" (350 mm, 13.8" Viewable Image Size), stealth black	1	-
28L3644	Space Saver II Keyboard	1	-

94G6676	APC Smart-UPS 3000RMB	1	-
External Storage			
3551001	NetMEDIA Storage Expansion Unit EL	1	External Tape Enclosure - Install in NetBAY3E
00N7990	40/80 GB DLT Internal SCSI Tape Drive	2	Installs in 3551001
03K9310	Netfinity 2M Ultra2 SCSI Cable	1	Tape to Onboard SCSI
35301RU	Netfinity EXP200 Storage Expansion Unit	1	Provides additional 10 Bays, 1 x 2M cable
37L0075	Netfinity EXP200 350 W Redundant Power Supply	1	-
36L9749	Netfinity 18.2 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	10	RAID 5 with Hot-Spare in EXP200
Stack Options			
28L4705	Netfinity 8Ux28D Rack-to-Tower Kit	1	-
36L9701	Netfinity NetBAY3E	3	3 x 3U enclosure for UPS, EXP200, Tape

Two Node High Availability Cluster



1.Customer supplied Ethernet Crossover Cable may vary in length up to a maximum of 25' (7.6 m).

Two Node High Availability Cluster

Part Number	Description	Quantity	Usage
Server Nodes A & B			
8681-8RY	Netfinity 8500R 700 MHz/2 MB, 512MB ECC, OPEN, 40X, PCI (8U)	2	Power redundancy standard
10K2166	Netfinity 8500R 700 MHz/2 MB Upgrade with Pentium III Xeon Processor	10	Total of 6 SMP processors per node
10K2335	Netfinity 4X Accelerator Filter	2	Required for greater than 4 processors
10K2337	Netfinity Mezzanine Expansion Kit	2	Required for greater than 4 processors
20L0247	Netfinity 256 MB SDRAM ECC RDIMM II	16	Total of over 2 GB of memory per node
28L4454	Netfinity 8500R Memory Expansion Card	2	Enables cache line interleaving
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2[1]	4	1 for crossover, 1 for public LAN/node
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter[2]	2	RAID controller - NOS plus EXP200
36L9744	Netfinity 9.1 GB Wide Ultra2 SCSI Hot-Swap SL HDD	4	NOS mirroring
94G6676	APC Smart-UPS 3000RMB (3U)	2	-
External Storage			
3551001	NetMEDIA Storage Expansion Unit EL (3U)	1	External Tape Drive Enclosure
03K9311	Netfinity 4.2 M Ultra2 SCSI Cable[3]	1	3551001 to onboard SCSI
00N7990	40/80 GB DLT Internal SCSI Tape Drive	1	Installs in 3551001
35301RU	Netfinity EXP200 Storage Expansion Unit (3U)[2]	1	Provides additional 10 bays
37L0075	Netfinity EXP200 350 W Redundant Power Supply[2]	1	-
03K9311	Netfinity 4.2 M Ultra2 SCSI Cable[2, 3]	2	3-HB to EXP200
36L9748	Netfinity 9.1 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	10	RAID 5 shared storage in EXP200
Shared (or single occurrence) Resources			
9511AG1	T55A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable), stealth black	1	Mounts in keyboard tray
28L3644	Space Saver II Keyboard	1	-
Rack Options			
930842P	Netfinity Enterprise Rack	1	-
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit II	1	Mounts in keyboard tray
28L4707	Netfinity Rack Keyboard Tray	1	-
28L0542	Netfinity Console Server Selector Switch (4-port)	1	-
94G6667	Power Cable-Type A14[3]	4	-
94G7447	NetBAY Console Cable Set 12 ft	2	-
94G6670	Blank Filler Panel Kit	1	-

1. Requires customer supplied Ethernet Crossover Cable which may vary in length up to a maximum of 25' (76 m).
2. By replicating these items, up to a total quantity of four ServeRAID-3HB Adapters (plus options) and eleven EXP200s can provide over 2 Terabytes of storage. Additional power and rack space will be required.
3. Cable length requirements are dependent on component placement within the rack or rack suite. To determine specific configuration requirements use the Netfinity Rack Configurator.

Clustering is a group of interconnected computers used as a single, unified computing resource. Clustering Netfinity servers, like the IBM Netfinity 8500R, provides a high availability solution to keep you in touch with the key applications you need to run your business.

This sample configuration consists of paired IBM Netfinity 8500R cluster nodes equipped with eight-way SMP capability and redundant power supplies. Microsoft Cluster Service (MSCS) has been validated on IBM Netfinity 8500R servers, using the Netfinity ServeRAID-3HB with the EXP200 Storage Expansion Unit. MSCS allows two configured servers, referred to as nodes, to be connected together to form a cluster. Providing system redundancy means that a complete server can fail and client access to server resources is largely unaffected. MSCS extends this theme by also allowing for software failures at an application level as well as an operating system level. If the operating system fails, all applications and services can be restarted on another server, and if just one application fails, it can be managed by MSCS individually. An additional independent network connection is used to perform monitoring within the cluster. One or more disk subsystems are attached to both nodes. In the above example, a Netfinity EXP200 was selected and the Netfinity ServeRAID-3HB Ultra2 SCSI Adapters provide the I/O control. Netfinity ServeRAID-3HB handles the "SCSI heartbeat" connection without the need for a dedicated SCSI connection and logically attaches the quorum disk, which allows arbitration when a failure occurs. Additional information on IBM Netfinity and IBM PC Server Clustering Solutions may be found on the World Wide Web by accessing URL www.ibm.com/pc/us/netfinity/clustering.html.

IBM External Storage Expansion Unit Overview

Part Number	Subsystem Type	Total Bays	Hot-Swap Bays: total, available	Maximum Internal Storage Capacity(GB)	Dimensions (W x D x H)	Form Factor	Max. Cfg. Wt.	Power Supply
35301RU Netfinity EXP200	Ultra2 SCSI LVDS	10	10, 10	364	447 mm x 571.5 mm x 128.8 mm (17.6 in. x 22.5 in. x 5.1 in.)	Rack Drawer (3U)[1]	36.1 kg (79.6 lbs)	350 Watts[2]
35421RU FAStT200	Fibre Channel	10	10, 10	364	480 mm x 575 mm x 131.8 mm (18.9 in. x 22.63 in. x 5.2 in.)	Rack Drawer (3U)	42.3 kg (94.0 lbs)	Redundant 350 Watts
35422RU FAStT200 HA[5]	Fibre Channel	10	10, 10	364	480 mm x 575 mm x 131.8 mm (18.9 in. x 22.63 in. x 5.2 in.)	Rack Drawer (3U)	42.3 kg (94.0 lbs)	Redundant 350 Watts
35311RU EXP300	Ultra160 LVDS	14	14, 14[3]	509.6	444 mm x 519 mm x 127.5 mm (17.5 in. x 20.4 in. x 5.0 in.)	Rack Drawer (3U)[1]	34.5 kg (76.1 lbs.)	Redundant 500 Watts
35601RU FAStT EXP500	Fibre Channel[4]	10	10, 10	364	447 mm x 563 mm x 128 mm (17.6 in. x 22.2 in. x 5.0 in.)	Rack Drawer (3U)	36.1 kg (79.6 lbs)	Redundant 350 Watts

To attach a Storage Enclosure to an IBM Netfinity Server, the following is required:
* Attachment to an appropriate SCSI or Fibre controller.
* External Cable(s) - See Appendix D: Cables - Storage Units - Controllers.

1. A rack-to-tower conversion kit option is available.
2. A redundant power supply is available.
3. Supports the use of slim-line drives only.
4. Attachment to a FAStT500 Storage Server (P/N 35521RU) is required for this device to function. See FAStT EXP500 Configurator section for more information.
5. Identical to FAStT200 (P/N 35421RU) with the addition of a second FAStT200 Failsafe RAID Controller.

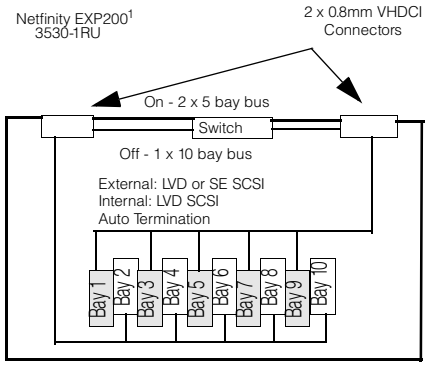
IBM Netfinity EXP200 (35301RU) Configurator

Netfinity EXP200 Hard Disk Drive (HDD) Storage

Total Int. Storage[1]	7200RPM Hard Disk Drives (HDDs)			10,000RPM Hard Disk Drives (HDDs)		
	9.1 GB (P/N 36L9744 or 37L7201)[2]	18.2 GB (P/N 36L9745 or 37L7202)[2]	36.4 GB (P/N 36L9746 or 37L7203)[2]	9.1 GB (P/N 36L9748 or 37L7204)[2]	18.2 GB (P/N 36L9749 or 37L7205)[2]	36.4 GB (P/N 36L9750 or 37L7206)[2]
0 GB	Standard on Base Models			Standard on Base Models		
9.1 GB	1	-	-	1	-	-
18.2 GB	2	1	-	2	1	-
27.3 GB	3	-	-	3	-	-
36.4 GB	4	2	1	4	2	1
45.5 GB	5	-	-	5	-	-
54.6 GB	6	3	-	6	3	-
63.7GB	7	-	-	7	-	-
72.8 GB	8	4	2	8	4	2
81.9GB	9	-	-	9	-	-
91 GB	10	5	-	10	5	-
109.2 GB	-	6	3	-	6	3
127.4GB	-	7	-	-	7	-
145.6GB	-	8	4	-	8	4
163.8GB	-	9	-	-	9	-
182GB	-	10	5	-	10	5
218.4GB	-	-	6	-	-	6
254.8GB	-	-	7	-	-	7
291.2 GB	-	-	8	-	-	8
327.6 GB	-	-	9	-	-	9
364 GB (max)	-	-	10	-	-	10

This table does not represent all possible hard drive configurations.
1. Select a total storage row then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within ± 0.2 GB unless otherwise noted.
2. Ultra160 HDDs are limited to a maximum of Ultra2 bus speeds.

Bay	Form Factor	Height	Front Access	Usage	Bus
Odd #s	HS	HH	yes	open	1
Even #s	HS	HH	yes	open	2



1. Housed in a 19" rack-mountable drawer and ships standard with a single power supply, power cord and 2 meter Ultra2 SCSI cable.
Requires IBM Netfinity Enterprise Rack (P/N 930842P) or Expansion Cabinet (P/N 9308842X), Rack (P/N 9306900), NetBAY22 (P/N 9306200), NetBAY3 (P/N 10L6912) or NetBAY3E (P/N 36L9701).
External Storage Expansion Unit requires storage controllers and external cables. Select a supported controller from the system configurator and cables from Appendix D: Cables-Storage Units-Controllers.

Part Number	Description	RPM	Height	Bays Supported	Max. Qty.
Ultra2 Hard Disk Drives (HDD)					
36L9744	Netfinity 9.1 GB Wide Ultra2 SCSI Hot-Swap SL HDD	7200	SL	1...10	10
36L9745	Netfinity 18.2 GB Wide Ultra2 SCSI Hot-Swap SL HDD	7200	SL	1...10	10
36L9746	Netfinity 36.4 GB Wide Ultra2 SCSI Hot-Swap HDD	7200	HH	1...10	10
36L9748	Netfinity 9.1 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	10,000	SL	1...10	10
36L9749	Netfinity 18.2 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	10,000	SL	1...10	10
36L9750	Netfinity 36.4 GB 10K-3 Wide Ultra2 SCSI Hot-Swap HDD	10,000	HH	1...10	10
Ultra160 Hard Disk Drives (HDD)[1]					
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1...10	10
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1...10	10
37L7203	36.4 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1...10	10
37L7204	9.1 GB 10K-4 Ultra160	10,000	SL	1...10	10
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1...10	10
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1...10	10
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	1...10	10
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	1...10	10

	External Storage Expansion Units	Form Factor
35301RU	Netfinity EXP200 Storage Expansion Unit[2]	Rack (3U)
37L5857	Netfinity EXP200 Rack-to-Tower Conversion Kit	-
37L0075	Netfinity EXP200 350 W Redundant Power Supply	-

1. Ultra160 HDDs are limited to a maximum of Ultra2 bus speeds.
2. Netfinity EXP200 Storage Expansion Unit ships with 10 half-high hot-swap bays which can be configured as a single bus, two independent buses or twintailed single bus. Netfinity EXP200 includes a single 2 M Ultra2 SCSI cable and a single hot-swap 350 W power supply and power cord. Optional hot-swap Netfinity EXP200 350 W Redundant Power Supply (P/N 37L0075) includes an additional power cord. To convert an EXP200 to a tower form factor, Netfinity EXP200 Rack-to-Tower Conversion Kit (P/N 37L5857) is required.

Limitations

Netfinity EXP200 hot-swapping of HDDs is restricted to a HDD that is inactive or where a lighted fault LED is indicated. The EXP200 is not supported when the SCSI channel of the SCSI adapter to which it is attached is split between internal devices and external devices. Each EXP200 must be attached to a dedicated SCSI channel of a supported SCSI adapter. The standard EXP200 configuration is supported as a rack drawer and is not currently supported for stacking directly on one another. It can be installed in a Netfinity NetBAY3 or NetBAY3E storage unit and stacked up to three units high, with a supported server on top. In addition, it can be converted to a tower with the addition of a Netfinity EXP200 Rack-to-Tower Conversion Kit (37L5857). See Appendix D: Cables- Storage Units- Controllers for supported controllers and cables. A single two meter cable is included with the EXP200.

Cable Length (Meters)[1]	Maximum MB/s	
	Ultra2 Controller	Ultra Controller
1 and 2	80	40
3	80	20
4.3	80	20
12 and 20	80	N/A

1. The EXP200 ships with a single Ultra2 SCSI cable similar to Netfinity 2 M Ultra2 SCSI Cable (P/N 03K9310).

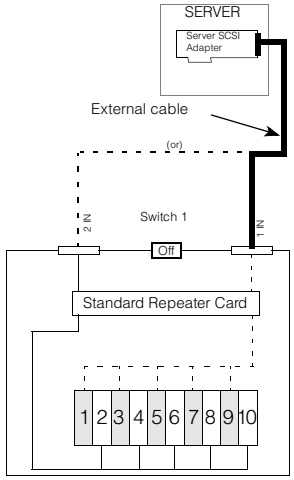
Cables and Controllers:
See Appendix D: Cables - Storage Units - Controllers

Sample Configurations

The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

Netfinity EXP200 One Independent SCSI Bus

To configure as a single 10 drive SCSI channel, attach one external cable from the SCSI adapter to either the 1 IN or 2 IN connectors in the EXP200. Set switch 1 to "Off" position.

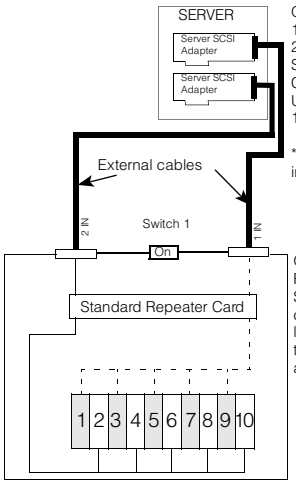


Order:
1 x 3530-1RU
1 x External Cable*
See Cables - Storage Units - Controllers section
Up to 10 Disk Drives
19" Rack Space
* One 2M Ultra2 cable is included with each EXP200.

Operational mode (SCSI F/W, Ultra SCSI, Ultra2 SCSI) may be limited by controller, cable or cable length. See Appendix D for additional information.

Netfinity EXP200 Two Independent SCSI Buses

To configure as two independent 5 drive SCSI channels, attach one external cable from the SCSI adapter to the SCSI bus 1 IN connector in the EXP200. Attach a second External SCSI cable from another SCSI adapter, in the same or separate server, to the 2 IN connector in the unit. Set switch 1 to "On" position.



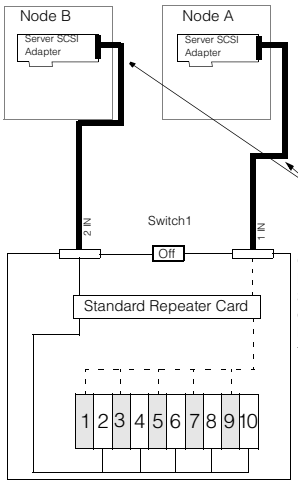
Order:
1 x 3530-1RU
2 x External Cables*
See Cables - Storage Units - Controllers section
Up to 10 Disk Drives
19" Rack Space

* One 2M Ultra2 cable is included with each EXP200.

Operational mode (SCSI F/W, Ultra SCSI, Ultra-2 SCSI) may be limited by controller, cable or cable length, or hard disk drive type. See Appendix D for additional information.

Netfinity EXP200 One Independent SCSI Bus
High Availability Configuration

To configure a single 10 drive SCSI channel for clustering, attach one external cable from the SCSI adapter in Node A to the 1 IN connector in the EXP200. Connect a second external cable to a SCSI adapter in Node B and to the 2 IN connector in the EXP200.



Order:
1 x 3530-1RU
2 x External Cables*
See Cables - Storage Units - Controllers section
Up to 10 Disk Drives
19" Rack Space
* One 2M Ultra2 cable is included with each EXP200.

Operational mode (SCSI F/W, Ultra SCSI, Ultra-2 SCSI) may be limited by controller, cable, or cable length. See Appendix D for additional information.

FAStT200 Storage Server (3542xRU)

FAStT200 (HA) Storage Expansion Unit

Total Internal Storage[1]	10,000 RPM Hard Disk Drives (HDDs)			
	9.1 GB (P/N 37L6209)	18.2 GB (P/N 37L6210 or 19K0652)	36.4 GB (P/N 37L6211 or 19K0653)	73.4 GB (P/N 19K0654)
0 GB	Standard on all Base Models			
18.2 GB	2	1	-	-
36.2 GB	4	2	1	-
54.6 GB	6	3	-	-
72.8 GB	8	4	2	-
73,4 GB	-	-	-	1
91.0 GB	10	5	-	-
109.2 GB	-	6	3	-
145.6 GB	-	8	4	-
146.8 GB	-	-	-	2
182.0 GB	-	10	5	-
218.4 GB	-	-	6	-
220.2 GB	-	-	-	3
254.8 GB	-	-	7	-
291.2 GB	-	-	8	-
293.6 GB	-	-	-	4
327.6 GB	-	-	9	-
364.0 GB	-	-	10	-
367.0 GB	-	-	-	5
440.4 GB	-	-	-	6
513.8 GB	-	-	-	7
587.2 GB	-	-	-	8
660.6 GB	-	-	-	9
734.0 GB (max)	-	-	-	10

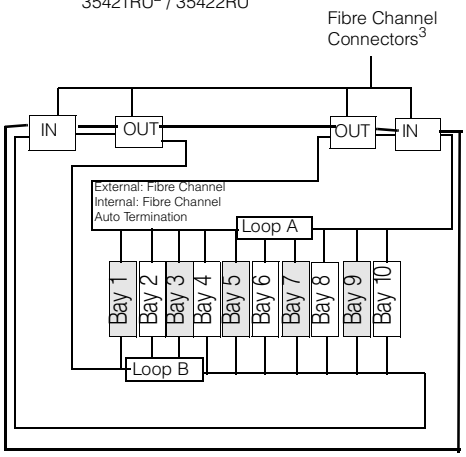
This table does not represent all valid hard drive configurations.
1. Select a total storage row and then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within +- 0.2 GB unless otherwise noted.

Part Number	Description	RPM	Height	Bays Supported	Max. Qty Supported
37L6209	Netfinity 9.1 GB 10K-3 FC Hot-Swap HDD	10,000	SL	1...10	10
37L6210	Netfinity 18.2 GB 10K-3 FC Hot-Swap HDD	10,000	SL	1...10	10
37L6211	Netfinity 36.4 GB 10K-3 FC Hot-Swap HDD	10,000	HH	1...10	10
19K0652	Netfinity 18.2 GB 10K-4 FC Hot-Swap HDD	10,000	SL	1...10	10
19K0653	Netfinity 36.4 GB 10K-4 FC Hot-Swap HDD	10,000	SL	1...10	10
19K0654	Netfinity 73.4GB 10K-4 FC Hot-Swap HDD	10,000	HH	1...10	10

External Storage Expansion Units		Form Factor
35421RU	FAStT200 Storage Server[1, 2]	Rack (3U)
35422RU	FAStT200 HA Storage Server[1]	Rack (3U)
19K1121	FAStT200 Redundant RAID Controller	-

1. The FAStT200 includes two hot-swap, 350 W auto-ranging redundant power supplies, each with its own power cord.
2. Can be upgraded to FAStT200 HA Storage Server through the addition of a FAStT200 Redundant RAID Controller (P/N 19K1121).

FAStT200 Storage Server[1]
35421RU[2] / 35422RU



1. Housed in a 19" Rack mountable drawer and ships standard with redundant power supplies and two power cables requiring separate power sources.
Requires an IBM industry standard 19" rack, EIA-310D with a minimum depth of 24" (711.2-mm) or NetBAY3/3E.
External Storage Expansion Units require storage controllers and external cables. Select a supported controller from the system configurator and cables from Appendix D: Cables-Storage-Units-Controllers.
2. 35421RU includes a single loop only. The second loop is available with the addition of FAStT200 Redundant RAID Controller P/N 19K1121.
3. GBICs are not included. Either Fibre Channel Long or Short-Wave GBICs (P/N 03K9307 or 03K9308 respectively) may be used.

IBM EXP300 (35311RU)

EXP300 Hard Disk Drive (HDD) Storage

Total Int. Storage[1]	7200RPM Hard Disk Drives (HDDs)			10,000RPM Hard Disk Drives (HDDs)		
	9.1 GB (P/N 36L9744 or P/N 37L7201)[2]	18.2 GB (P/N 36L9745 or P/N 37L7202)[2]	36.4 GB (P/N 37L7203)	9.1 GB (P/N 36L9748 or P/N 37L7204)[2]	18.2 GB (P/N 36L9749 or P/N 37L7205)[2]	36.4 GB (P/N 37L7206)
0 GB	Standard on Base Models			Standard on Base Models		
18.2 GB	2	1	-	2	1	-
36.4 GB	4	2	1	4	2	1
54.6 GB	6	3	-	6	3	-
72.8 GB	8	4	2	8	4	2
91 GB	10	5	-	10	5	-
109.2 GB	12	6	3	12	6	3
127.4 GB	14	7	-	14	7	-
145.6GB	-	8	4	-	8	4
182 GB	-	10	5	-	10	5
218.4 GB	-	12	6	-	12	6
254.8 GB	-	14	7	-	14	7
291.2 GB	-	-	8	-	-	8
364.0 GB	-	-	10	-	-	10
436.8 GB	-	-	12	-	-	12
509.6 GB (max.)	-	-	14	-	-	14

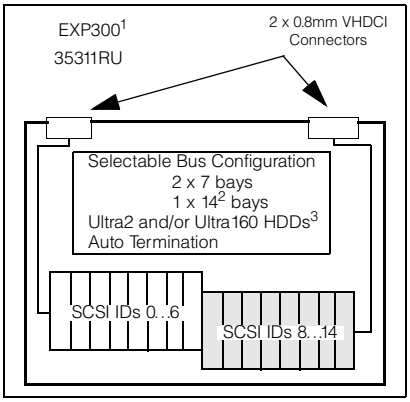
This table does not represent all possible hard drive configurations.
1. Select a total storage row then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within +/- 0.2 GB unless otherwise noted.
2. When combined with a ServeRAID-4x controller, Ultra2 and Ultra160 HDD's may be mixed on the same bus and operate up to their maximum respective speeds.

SCSI ID	Form Factor	Height	Front Access	Usage
0…6	HS	SL	Yes	open
8…14	HS	SL	Yes	open

	Maximum MB/s	
Cable Length (Meters	Ultra2 Controller	Ultra160 Controller
2	80	160
4.2	80	160

Part Number	Description	RPM	Height	Bays Supported[1]	Max. Qty.
	Ultra2 Hard Disk Drives (HDD)[2]				
36L9744	Netfinity 9.1 GB Wide Ultra2 SCSI Hot-Swap SL HDD	7200	SL	1…14	14[3]
36L9745	Netfinity 18.2 GB Wide Ultra2 SCSI Hot-Swap SL HDD	7200	SL	1…14	14[3]
36L9748	Netfinity 9.1 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	10,000	SL	1…14	14[3]
36L9749	Netfinity 18.2 GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD	10,000	SL	1…14	14[3]
	Ultra 160 Hard Disk Drives (HDD)[2]	**RPM**	**Height**	**Bays Supported**	
37L7201	9.1 GB Wide Ultra2 SCSI Hot-Swap SL HDD	7200	SL	1…14	14[3]
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1…14	14[3]
37L7203	36.4 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1…14	14[3]
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1…14	14[3]

1. The EXP300 ships with a single Ultra2 SCSI cable similar to Netfinity 2M Ultra2 SCSI Cable (P/N 03K9310).



1. Housed in a 19" rack mountable drawer and ships standard with redundant 500 W hot-swap power supplies, two power cords and a single 2M Ultra2 SCSI cable capable of supporting Ultra160 speeds.
2. Twintailing reduces the maximum number of HDDs on a single bus to 13.
3. When combined with a ServeRAID-4x controller, Ultra2 and Ultra160 HDDs may be mixed on the same bus and operate at up to their maximum respective speeds.

Requires IBM Netfinity Enterprise Rack (930842P) or Expansion Cabinet (930842X), Rack (9306900), NetBAY22 (9306200), NetBAY3 (10L6912), NetBAY3E (36L9701) or Rack-to-Tower Conversion Kit (09N7296).

External Storage Expansion Units require storage controllers and external cables. Select a supported controller from the system configurator and cables from Appendix D: Cables-Storage Units-Controllers.

37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1...14	14[3]
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1...14	14[3]
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15000	SL	1...14	14[3]
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15000	SL	1...14	14[3]

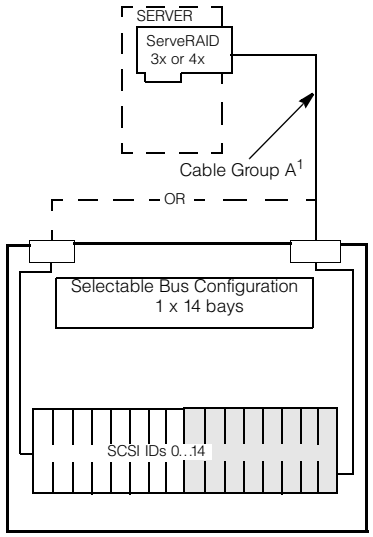
	External Storage Expansion Units	**Form Factor**
35311RU	EXP300 Storage Expansion Unit[4]	Rack (3U)
09N7296	EXP300 Rack-to-Tower Conversion Kit	-

1. EXP300 Storage Expansion Unit ships with 14 slim-line hot-swap bays which can be configured as a single bus, two independent buses or a twintailed single bus.
2. When combined with a ServeRAID-4x controller, Ultra2 and Ultra160 HDDs may be mixed on the same bus and operate at up to their maximum respective speeds.
3.Twintailing reduces the maximum number of HDDs on a single bus to 13.
4. EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500W redundant power supplies, each with its own power cord.

Cables and Controllers:
See Appendix D: Cables - Storage Units - Controllers

EXP300 Sample Configurations

EXP300 One Independent SCSI Bus

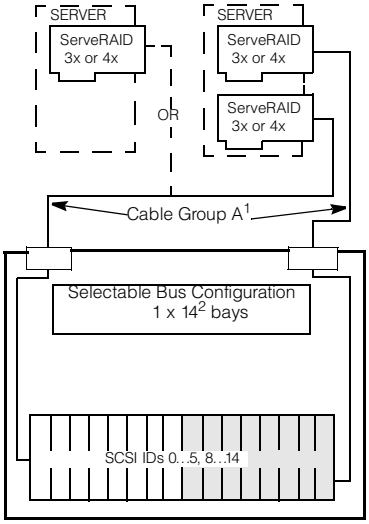


Order:
- 1 x 35311RU
- 1 x External Cable from Group A[1]
- Up to 14 Ultra2 and/or Ultra160 HDDs

1. One 2 M Ultra2 cable is included with each EXP300. If a longer cable is desired, select one from cable group A.

EXP300 One Independent Twintail SCSI Bus High Availability Configuration

To configure as one independent twintailed 13 bay SCSI bus, attach two external cables from two ServeRAID adapters, in the same or separate servers, to the two external ports of the EXP300. The EXP300 must be set for 1 x 14[2] bays.

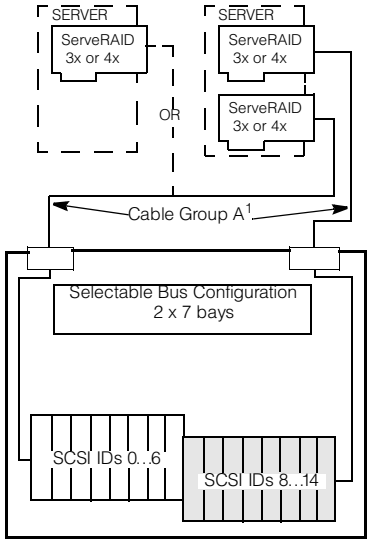


Order:
- 1 x 35311RU
- 2 x External Cables from Group A[1]
- Up to 13 Ultra2 and/or Ultra160 HDDs

1. One 2 M Ultra2 cable is included with each EXP300. If a longer cable is desired, select one from cable droup A.
2. Twintailing reduces the maximum number of HDDs on a single bus to 13.

EXP300 Two Independent SCSI Buses

To configure as two independent 7 bay SCSI buses, attach two external cables from two ServeRAID adapters, in the same or separate servers, to the two external ports of the EXP300. The EXP300 must be set for 2 x 7 bays.



Order:
- 1 x 35311RU
- 2 x External Cables from Group A[1]
- Up to 14 Ultra2 and/or Ultra160 HDDs

1. One 2 M Ultra2 cable is included with each EXP300. If a longer cable is desired, select one from cable droup A.

IBM FAStT EXP500 (35601RU)

FAStT EXP500 Storage Expansion Unit

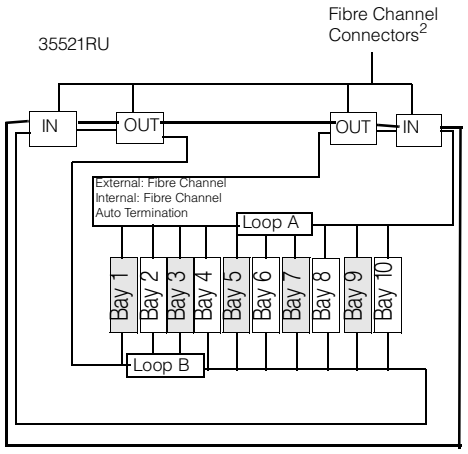
Total Internal Storage[1]	10,000 RPM Hard Disk Drives (HDDs)			
	9.1 GB (P/N 37L6209)	18.2 GB (P/N 37L6210 or 19K0652)	36.4 GB (P/N 37L6211 or 19K0653)	73.4 GB (P/N 19K0654)
0 GB	Standard on all Base Models			
18.2 GB	2	1	-	-
36.2 GB	4	2	1	-
54.6 GB	6	3	-	-
72.8 GB	8	4	2	-
73,4 GB	-	-	-	1
91.0 GB	10	5	-	-
109.2 GB	-	6	3	-
145.6 GB	-	8	4	-
146.8 GB	-	-	-	2
182.0 GB	-	10	5	-
218.4 GB	-	-	6	-
220.2 GB	-	-	-	3
254.8 GB	-	-	7	-
291.2 GB	-	-	8	-
293.6 GB	-	-	-	4
327.6 GB	-	-	9	-
364.0 GB	-	-	10	-
367.0 GB	-	-	-	5
440.4 GB	-	-	-	6
513.8 GB	-	-	-	7
587.2 GB	-	-	-	8
660.6 GB	-	-	-	9
734.0 GB (max)	-	-	-	10

This table does not represent all valid hard drive configurations.
1. Select a total storage row and then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within +- 0.2 GB unless otherwise noted.

Part Number	Description	RPM	Height	Bays Supported	Max. Qty Supported
37L6209	Netfinity 9.1 GB 10K-3 FC Hot-Swap HDD	10,000	SL	1…10	10
37L6210	Netfinity 18.2 GB 10K-3 FC Hot-Swap HDD	10,000	SL	1…10	10
37L6211	Netfinity 36.4 GB 10K-3 FC Hot-Swap HDD	10,000	HH	1…10	10
19K0652	Netfinity 18.2 GB 10K-4 FC Hot-Swap HDD	10,000	SL	1…10	10
19K0653	Netfinity 36.4 GB 10K-4 FC Hot-Swap HDD	10,000	SL	1…10	10
19K0654	Netfinity 73.4GB 10K-4 FC Hot-Swap HDD	10,000	HH	1…10	10
External Storage Expansion Units		**Form Factor**			
35601RU	FAStT EXP500 Storage Expansion Unit[1]	Rack (3U)			

1. The FAStT EXP500 ncludes two hot-swap, 350 W auto-ranging redundant power supplies, each with its own power cord.

FAStT EXP500[1]



1. Housed in a 19" Rack mountable drawer and ships standard with redundant power supplies and two power cables requiring separate power sources.

Requires an IBM industry standard 19" rack, EIA-310D with a minimum depth of 24" (711.2-mm) or NetBAY3/3E.

External Storage Expansion Units require storage controllers and external cables. Select a supported controller from the system configurator and cables from Appendix D: Cables-Storage-Units-Controllers.

2. GBICs are not included. Either Fibre Channel Long or Short-Wave GBICs (P/N 03K9307 or 03K9308 respectively) may be used.

Fibre Array Solutions

Fibre Interconnection Guidelines

Part Number	Description	00N6881 FAStT Host Adapter	00N6882 FAStT Mini Hub [1]	01K7296 FC Failsafe RAID Controller	19K1121 FastT200 Redun. Raid Controller [1]	2108R3D SAN Data Gateway Router (Diff.) [1]	2108R3S SAN Data Gateway Router (SE) [1]	2109S08 SAN FC Switch, 8-Port [1]	2109S16 SAN FC Switch, 16-Port [1]	35261RU FC RAID Controller Unit	35341RU SAN FC Managed Hub [1]	35421RU FAStT200 Storage Server [1]	35422RU FAStT200 HA Storage Server [1]	35521RU FAStT500 Storage Server [1]	35601RU FAStT EXP500 [1]
00N6881	FAStT Host Adapter	-	-	S	S	S	S	S	S	S	S	S	S	S	-
00N6882	FAStT500 Mini Hub	-	E	-	E	-	-	E	E	-	-	-	-	H	E
01K7296	FC Failsafe RAID Controller	-	-	-	-	-	-	S	S	H	S	-	-	-	-
19K1121	FAStT200 Redundant RAID Controller	S	-	-	-	-	-	E	E	-	E	H	-	-	-
2108R3D	SAN Data Gateway Router (Diff.)	S	-	-	-	-	-	S	S	-	S	-	-	-	-
2108R3S	SAN Data Gateway Router	S	-	-	-	-	-	S	S	-	S	-	-	-	-
2109S08	SAN FC Switch, 8-Port	S	E	S	E	S	S	E	E	E	-	E	E	E	E
2109S16	SAN FC Switch, 16-Port	S	E	S	E	S	S	E	E	E	-	E	E	E	E
35261RU	FC RAID Controller Unit	S	-	H	-	-	-	S	S	-	-	-	-	-	-
35341RU	SAN FC Managed Hub	S	E	S	E	S	S	-	-	E	E	E	E	E	-
35421RU	FAStT200 Storage Server	S	-	-	H	-	-	E	E	-	E	-	-	-	E
35422RU	FAStT200 HA Storage Server	S	-	-	-	-	-	E	E	-	E	-	-	-	E
35521RU	FAStT500 Storage Server	-	H	-	-	-	-	E	E	-	E	-	-	-	E
35601RU	FAStT EXP500	-	E	-	E	-	-	-	-	-	-	E	E	E	E
03K9307	FC Long-Wave GBIC	-	H	-	H	-	-	H	H	H	H	H	H	H	H
03K9308	FC Short-Wave GBIC	-	H	-	H	-	-	H	H	H	H	H	H	H	H

S Short-wave connection only. See Fibre Device Ports Reference section for GBIC/Integrated port information.
L Long-wave connection only. See Fibre Device Ports Reference section for GBIC/Integrated port information
E Either Short-wave or Long-wave connections allowed. See Fibre Device Ports Reference section for GBIC/Integrated pinformation.
H Hardware connection. One of these devices installs directly into the other. i.e.: The FAStT500 Mini Hub (P/N 00N6882) installs directly into the FAStT500 Storage Server (P/N 35521RU) to provide GBIC availability

1. This device requires the use of GBICs. Purchase of GBICs may be needed in order to make connections to this device. See the Fibre Device Ports Reference section for GBIC/Integrated port information.

For the latest product & technical information, refer to the Information Sources on pages 1 and 2.

Fibre Device Ports Reference

Part Number	Description	Total Connections Possible	Integrated Ports	Mini Hubs Possible	Mini Hubs Installed	GBIC Ports	GBICs Included
00N6881	FAStT Host Adapter	1	1	-	-	-	-
00N6882	FAStT500 Mini Hub[1]	2	-	-	-	2	-
01K7296	FC Failsafe RAID Controller	1	1	-	-	-	-
03K9307	FC Long-Wave GBIC	1	1	-	-	-	-
03K9308	FC Short-Wave GBIC	1	1	-	-	-	-
19K1121	FAStT200 Redundant RAID Controller	2	-	-	-	2	-
2108R3D	SAN Data Gateway Router (Diff.)[2]	1	1	-	-	-	-
2108R3S	SAN Data Gateway Router[3]	1	1	-	-	-	-
2109S08	SAN FC Switch, 8-Port	8	-	-	-	8	4[4]
2109S16	SAN FC Switch, 16-Port	16	-	-	-	16	4[4]
35261RU	FC RAID Controller Unit	1	1	-	-	-	-
35341RU	SAN FC Managed Hub	8	7	-	-	1	-
35421RU	FAStT200 Storage Server	2	-	-	-	2	-
35422RU	FAStT200 HA Storage Server	4	-	-	-	4	-
35521RU	FAStT500 Storage Server	16[5]	-	8	4	8[1]	-
35601RU	FAStT EXP500	5	-	-	-	4	-

1. Each FAStT500 Mini Hub provides two GBIC ports.
2. Differential SCSI.
3. Single-ended SCSI.
4. Included GBICs and integrated optical ports are short-wave.
5. FAStT500 Storage Server supports up to eight non-redundant or four redundant host connections and up to eight non-redundant or four redundant storage connections.

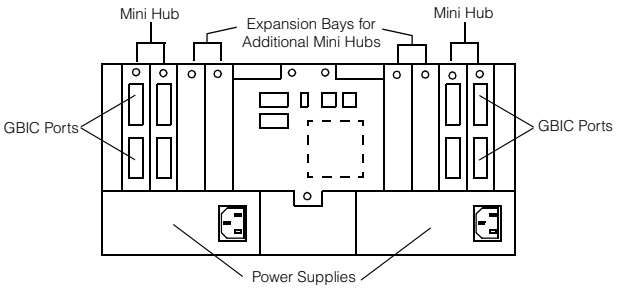
Supported Cable Groups	
Cable Group A (0.8 mm to 0.8 mm)	
03K9310	Netfinity 2 M Ultra2 SCSI Cable
03K9311	Netfinity 4.2 M Ultra2 SCSI Cable
37L7101	Netfinity 20 M Ultra2 SCSI Cable
Cable Group D (Short-Wave Fibre)	
36L9973	Netfinity Fibre Channel 1 M Cable
03K9306	Netfinity Fibre Channel 5 M Cable
03K9305	Netfinity Fibre Channel 25 M Cable
Customer supplied short-wave cable of up to 500 meters (0.31 miles)	
Cable Group E (Long-Wave Fibre)	
Customer supplied long-wave cable of up to 10 kilometers (6.2 miles)	
GBIC	
03K9308	Netfinity Fibre Channel Short-Wave GBIC[1]
03K9307	Netfinity Fibre Channel Long-Wave GBIC

1. Four Netfinity Fibre Channel Short-Wave GBIC's (P/N 03K9308) are included with SAN Fibre Channel Switches (P/Ns 2109508 and 2109516).

Netfinity FAStT Host Adapter 00N6881

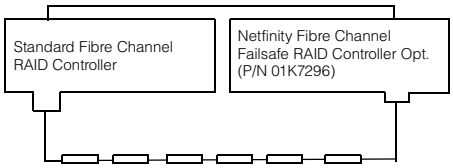
- PCI to FCAL 64/32-bit host adapter.
- Supported Attachments (use cable group D):
  FAStT500 Storage Server
- Integrated short-wave optical port. No GBICs required.
- Full Fibre Channel Fabric support.

FAStT500 Storage Server 35521RU



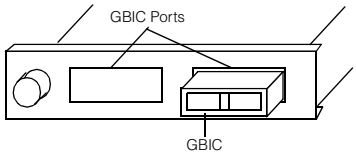
- Dual high-performance, RAID controller cards-supports up to 100 MB/sec data transfer rate per controller.
- Two 175 W auto-ranging, hot-swap, redundant power supplies.
- Attach directly to FAStT Host Adapter(s) (P/N 00N6881) with shortwave cables and GBICs or indirectly through SAN Fibre Channel Managed Hub (P/N 35341RU) using cables from cable group D or E with corresponding GBICs.
- Height is 4U (1 U = 1.75 in. or 44.45 mm)
- Requires Netfinity Enterprise Rack or Expansion Cabinet, Netfinity Rack, Netfinity NetBAY22 or 19-inch EIA-D Industry-Standard Rack. Mounting rails are included with the controller.
- For optimum performance no more than two FAStT500 Storage Servers (P/N 35521RU) should be attached to a single hub (P/N 35341RU)
- Includes four FAStT500 Mini Hubs (P/N 00N6882), two for host and two for storage.
- FAStT500 256 MB Cache (P/N 00N6883) expansion is required in installations where a large number of devices are supported.
- All connections to FAStT500 Mini Hubs require the use of GBICs. GBICs not included.

Netfinity Fibre Channel RAID Controller (35261RU)



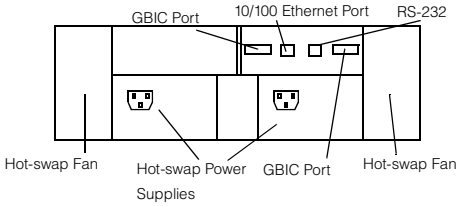
- Contains a single Short-Wave Fibre Connection (use cable group D) and six female 0.8 mm Very High Density Connection Interface (VHDCI) SCSI connectors
- Hot-Swap Redundant Fans and Power Supplies
- Optional Netfinity Fibre Channel Failsafe RAID Controller (P/N 01K7296) provides a redundant RAID controller and second Short-Wave Fibre Connection (use cable group D)
- Attach directly to FAStT Host Adapter(s) (P/N 00N6881) or indirectly through SAN Fibre Channel Managed Hub (P/N 35341RU) using cables from cable group D.
- Height is 4 U (1 U=1.75 in. or 44.45 mm)
- Requires Netfinity Enterprise Rack or Expansion Cabinet, Netfinity Rack, Netfinity NetBAY22 or 19-inch EIA-D Industry-Standard Rack. Mounting rails are included with the controller.
- For optimum performance no more than two RAID controller units (P/N 35261RU) should be attached to a single hub

Netfinity FAStT500 Mini Hub 00N6882



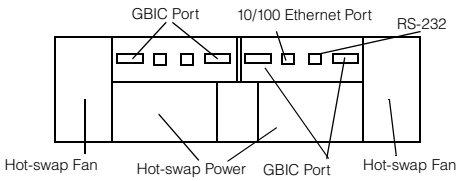
- Provides additional connections to the Netfinity FAStT500 Storage Server - supports complex clustering or advanced storage applications.
- All connections to FAStT500 Mini Hubs require the use of GBICs. GBICs are not included.

FAStT200 Storage Server 35421RU



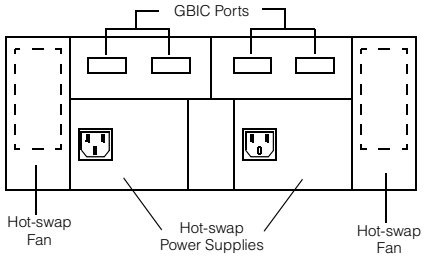
- Contains a single hot-plug, RAID controller which provides a single host Fibre Channel arbitrated loop and a single storage Fibre Channel arbitrated loop.
- Can be upgraded to a FAStT200 HA Storage Server through the addition of a FAStT200 Redundant RAID Controller (P/N 19K1121).
- Integrated 10/100 Mbps Ethernet connector and RS-232 service support port.
- Performance optimized for 30 disk drives - supports optional FAStT EXP500 Storage Expansion Units (P/N 35601RU).
- Two hot-swap 350 W auto-ranging, redundant power supplies.
- Redundant fans - two hot-swap, dual-fan units.
- LED indicators on all critical components warn of faults, over temperature, and other abnormalities.
- Ten drive bays - supports slim-high or half-high Fibre Channel hot-swap hard disk drives.
- Height is 3U (1U= 1.75 in or 44.45 mm.
- Requires Netfinity Enterprise Rack or Expansion Cabinet, Netfinity Rack, Netfinity NetBAY22 or 19-inch EIA-D industry standard rack. Mounting rails are included with the controller.
- Support long- and short-wave connections. Requires optional GBICs for each connection. GBICs not included.

FAStT200 HA Storage Server 35422RU



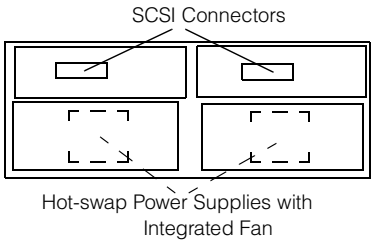
- Contains two hot-plug, RAID controllers. Each controller provides a single host Fibre Channel arbitrated loop and a single storage Fibre Channel arbitrated loop.
- Integrated 10/100 Mbps Ethernet connector and RS-232 service support port.
- Performance optimized for 30 disk drives- supports optional FAStT EXP500 Storage Expansion Units (P/N 35601RU).
- Two hot-swap 350 W auto-ranging, redundant power supplies.
- Redundant fans - two hot-swap, dual-fan units.
- LED indicators on all critical components warn of faults, over temperature, and other abnormalities.
- Ten drive bays - supports slim-high or half-high Fibre Channel hot-swap hard disk drives.
- Height is 3U (1U= 1.75 in or 44.45 mm.
- Requires Netfinity Enterprise Rack or Expansion Cabinet, Netfinity Rack, Netfinity NetBAY22 or 19-inch EIA-D industry standard rack. Mounting rails are included with the controller.
- Support long- and short-wave connections. Requires optional GBICs for each connection. GBICs not included.

FAStT EXP500 Storage Expansion Unit 35601RU



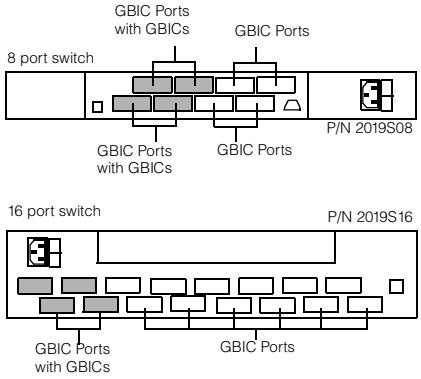
- Two hot-swap, 350 W auto-ranging, redundant power supplies.
- Redundant fans - two hot-swap, dual-fan units.
- LED indicators on all critical components warn of faults, over temperature, and other abnormalities.
- Ten drive bays - supports slim-high or half-high Fibre Channel hot-swap hard disk drives.
- Height is 3U (1 U = 1,75 in. or 44.45 mm)
- Requires Netfinity Enterprise Rack or Expansion Cabinet, Netfinity Rack, Netfinity NetBAY22 or 19-inch EIA-D Industry-Standard Rack. Mounting rails are included with the controller.
- Requires optional GBICs for each connection. GBICs not included.

EXP300 Storage Expansion Unit 35311RU



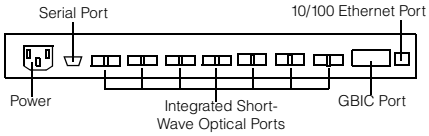
- Fourteen slim-high drive bays.
- Supports Ultra160 SCSI data transfer speeds - up to 160 MB/s.
- Single or dual SCSI bus configurations.
- Dual hot-swap 500 W redundant power supplies with integrated fan assemblies.
- Height is 3 U (1 U=1.75 in. or 44.45 mm).
- Tower capability through optional Rack-to-Tower Conversion Kit.
- Requires Netfinity Enterprise Rack or Expansion Cabinet, Netfinity Rack, Netfinity NetBAY22 or 19-inch EIA-D Industry-Standard Rack. Mounting rails are included with the controller.

SAN Fibre Channel Switch, 8 and 16 Ports 2109S08/S16



- Each port delivers up to 100 MB/sec, full-duplex data transfer.
- Comes with 4 Short-Wave GBICs installed.
- Embedded Web browser configuration, management and service.
- Support for Public Fibre Channel Arbitrated Loops.
- Optional power supply (P/N 09L5403) available.
- The 8 port switch is 1 U (1 U=1.75 in. or 44.45 mm) high and the 16 port switch is 2 U (1 U=1.75 in. or 44,45 mm) high.

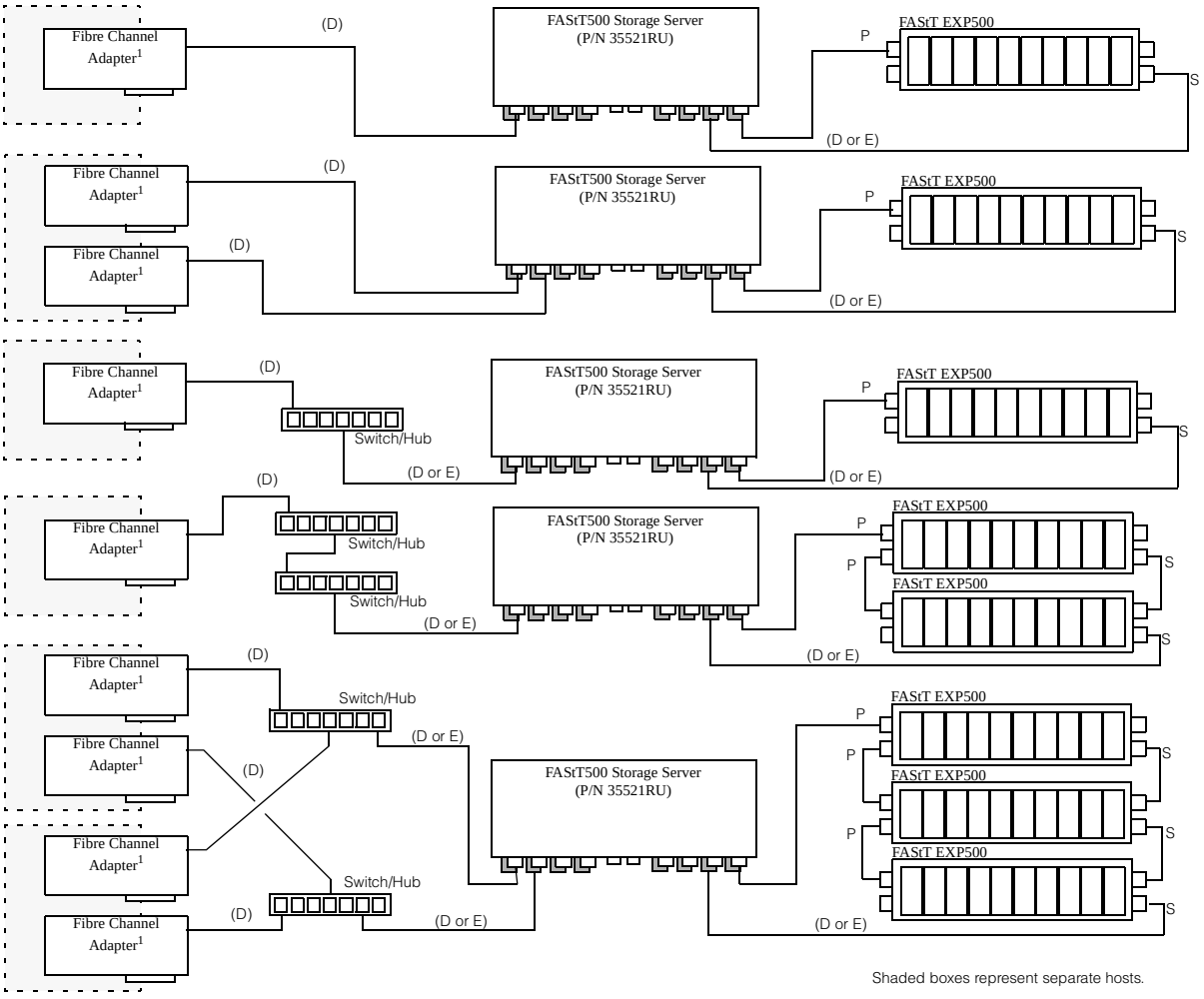
SAN Fibre Channel Managed Hub 35341RU



- High-speed performance utilizing nonblocking switch-based technology.
- Simultaneous 100 MB/sec full duplex data transfers across all ports.
- Eight ports, one that is configurable with either a short-wave or long-wave optical GBIC.
- Support for industry standard MIBs enabling standard SNMP management.
- Height is 1 U (1 U=1.75 in. or 44.45 mm) high.

Fibre / Fibre Configuration Examples - Cable Group ()

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

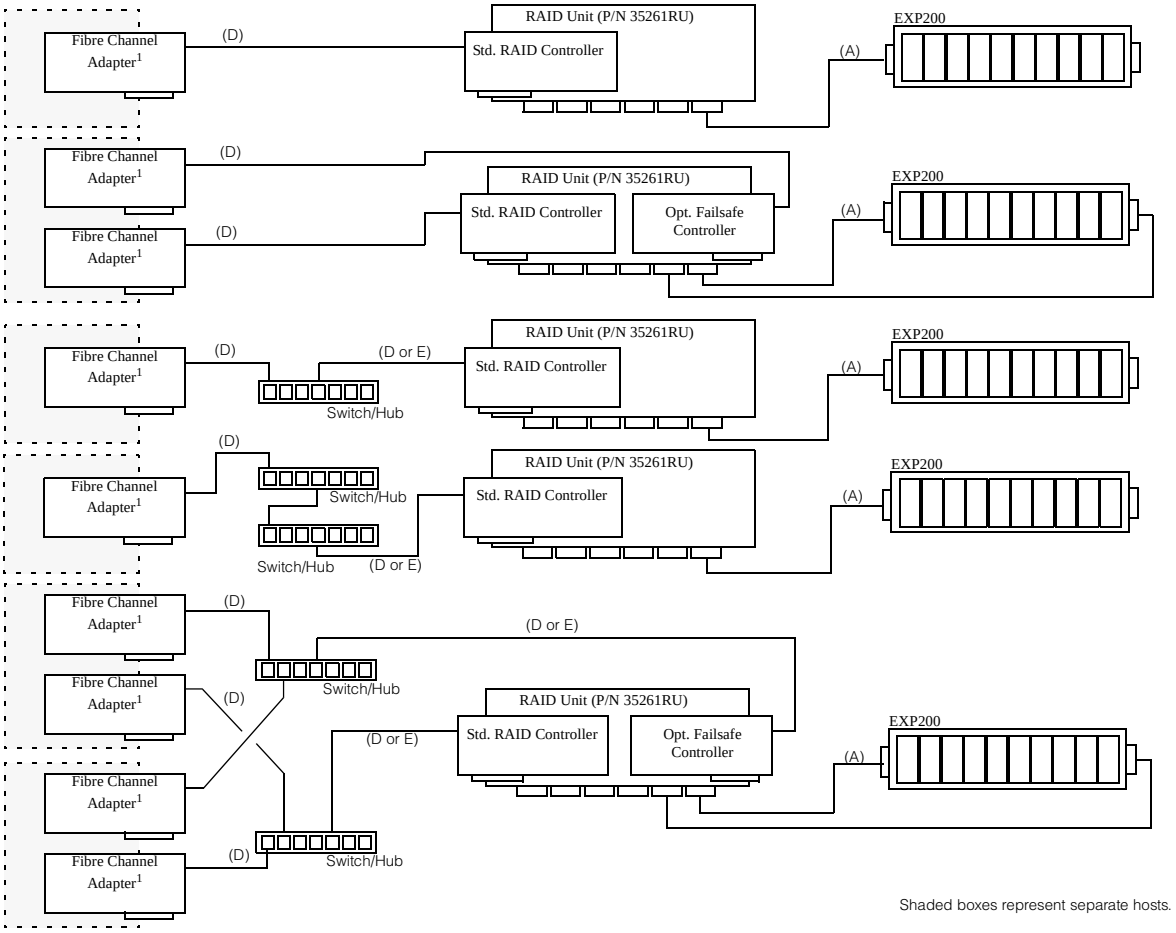


1. FAStT Host Adapter (P/N 00N6881) supports shortwave connections only.

P = Primary path, S = Secondary/Redundant path
All storage connections require a secondary/redundant pathway in order to function properly.

Fibre / SCSI Configuration Examples- Cable Group ()

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

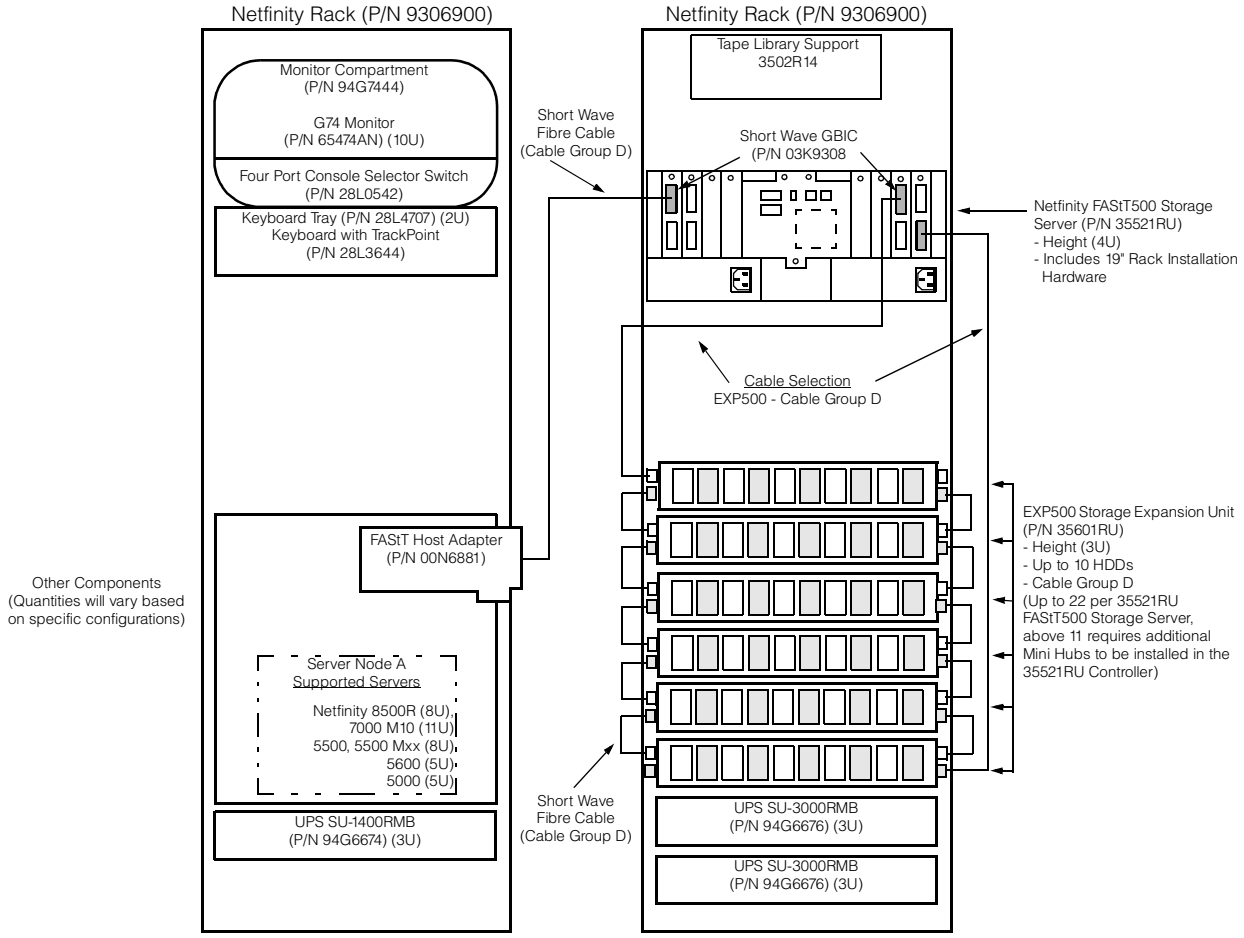


1. Configured as two independent 5 HDD buses.

IBM Netfinity Fibre Array Solutions

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements

High-speed single-node Netfinity Fibre Channel Storage configuration offering performance, bandwidth & capacity


Netfinity Rack (P/N 9306900)
Netfinity Rack (P/N 9306900)
Monitor Compartment (P/N 94G7444)
G74 Monitor (P/N 65474AN) (10U)
Four Port Console Selector Switch (P/N 28L0542)
Keyboard Tray (P/N 28L4707) (2U)
Keyboard with TrackPoint (P/N 28L3644)
Tape Library Support 3502R14
Short Wave Fibre Cable (Cable Group D)
Short Wave GBIC (P/N 03K9308
Netfinity FAStT500 Storage Server (P/N 35521RU)
- Height (4U)
- Includes 19" Rack Installation Hardware
Cable Selection
EXP500 - Cable Group D
FAStT Host Adapter (P/N 00N6881)
Other Components (Quantities will vary based on specific configurations)
Server Node A
Supported Servers
Netfinity 8500R (8U),
7000 M10 (11U)
5500, 5500 Mxx (8U),
5600 (5U),
5000 (5U)
EXP500 Storage Expansion Unit (P/N 35601RU)
- Height (3U)
- Up to 10 HDDs
- Cable Group D
(Up to 22 per 35521RU FAStT500 Storage Server, above 11 requires additional Mini Hubs to be installed in the 35521RU Controller)
Short Wave Fibre Cable (Cable Group D)
UPS SU-1400RMB (P/N 94G6674) (3U)
UPS SU-3000RMB (P/N 94G6676) (3U)
UPS SU-3000RMB (P/N 94G6676) (3U)

Connector Types
68-pin - High Density Connector
0.8 mm - Very High Density Connection Interface VHDCI

Cable Group A (0.8 mm to 0.8 mm)
03K9310 - Netfinity 2 M Ultra2 SCSI Cable
03K9311 - Netfinity 4.2 M Ultra2 SCSI Cable
37L7101- Netfinity 20 M Ultra2 SCSI Cable

Cable Group D (Short-Wave Fibre)
36L9973 - Netfinity Fibre Channel 1 M Cable
03K9306 - Netfinity Fibre Channel 5 M Cable
03K9305 - Netfinity Fibre Channel 25 M Cable
Customer supplied short-wave cable of up to 500 meters (0.31 miles)

Cable Group E (Long-Wave Fibre)
Customer supplied long-wave cable of up to 10 kilometers (6.2 miles)

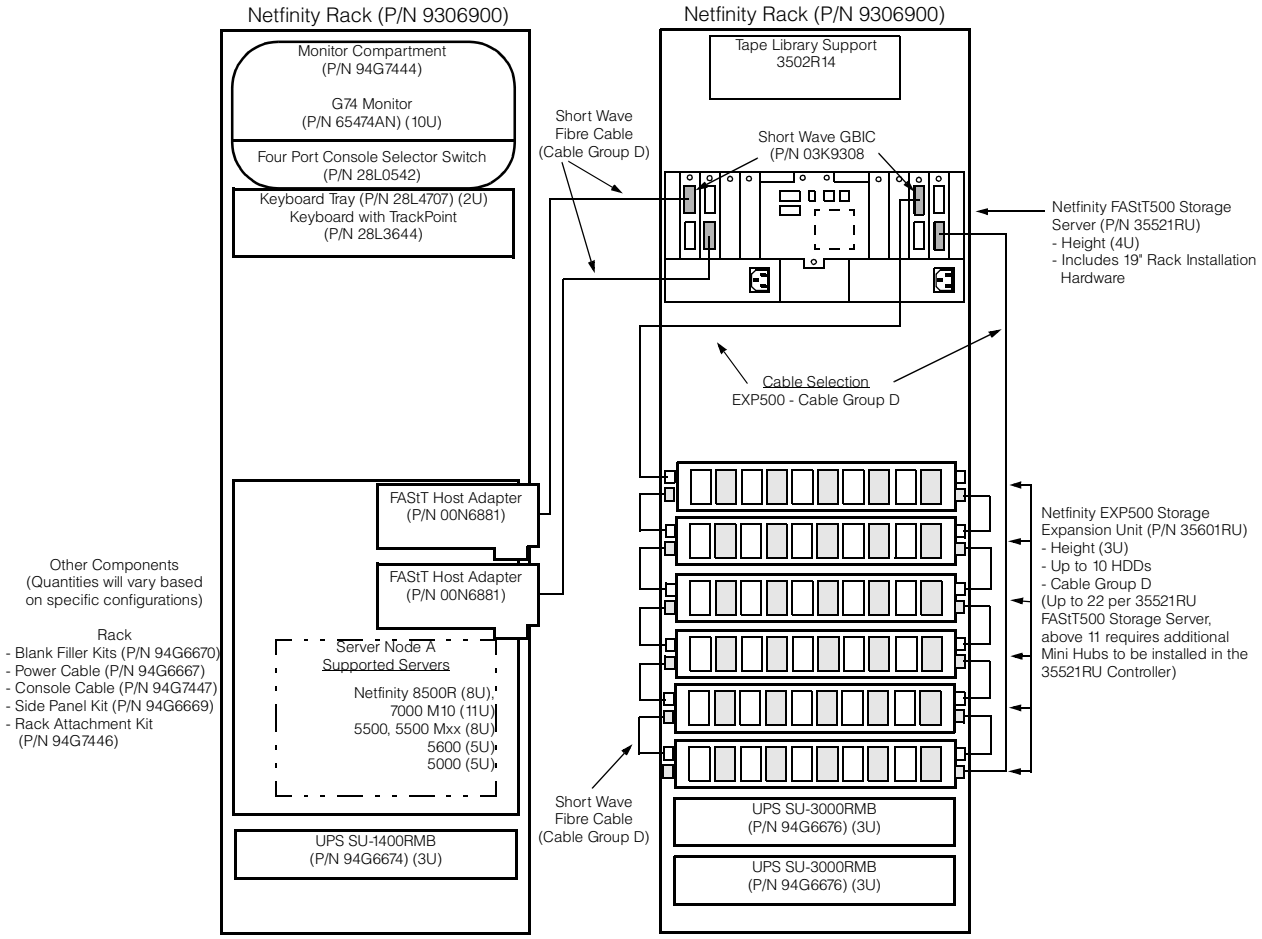
GBIC
03K9308 - Netfinity Fibre Channel Short-Wave GBIC[1]
03K9307 - Netfinity Fibre Channel Long-Wave GBIC

1. Four Netfinity Fibre channel Short-Wave GBIC's (P/N 03K9308) are included with SAN Fibre Channel Managed Hub (P/N 35341RU)

IBM Netfinity Fibre Array Solutions

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements

High-speed single-node Netfinity Fibre Channel Storage configuration with Microsoft NT failover support and RAID redundancy for availability, performance, capacity



Connector Types
68-pin - High Density Connector
0.8 mm - Very High Density Connection Interface VHDCI

Cable Group A (0.8 mm to 0.8 mm)
03K9310 - Netfinity 2 M Ultra2 SCSI Cable
03K9311 - Netfinity 4.2 M Ultra2 SCSI Cable
37L7101 - Netfinity 20 M Ultra2 SCSI Cable

Cable Group D (Short-Wave Fibre)
36L9973 - Netfinity Fibre Channel 1 M Cable
03K9306 - Netfinity Fibre Channel 5 M Cable
03K9305 - Netfinity Fibre Channel 25 M Cable
Customer supplied short-wave cable of up to 500 meters (0.31 miles)

Cable Group E (Long-Wave Fibre)
Customer supplied long-wave cable of up to 10 kilometers (6.2 miles)

GBIC
03K9308 - Netfinity Fibre Channel Short-Wave GBIC
03K9307 - Netfinity Fibre Channel Long-Wave GBIC

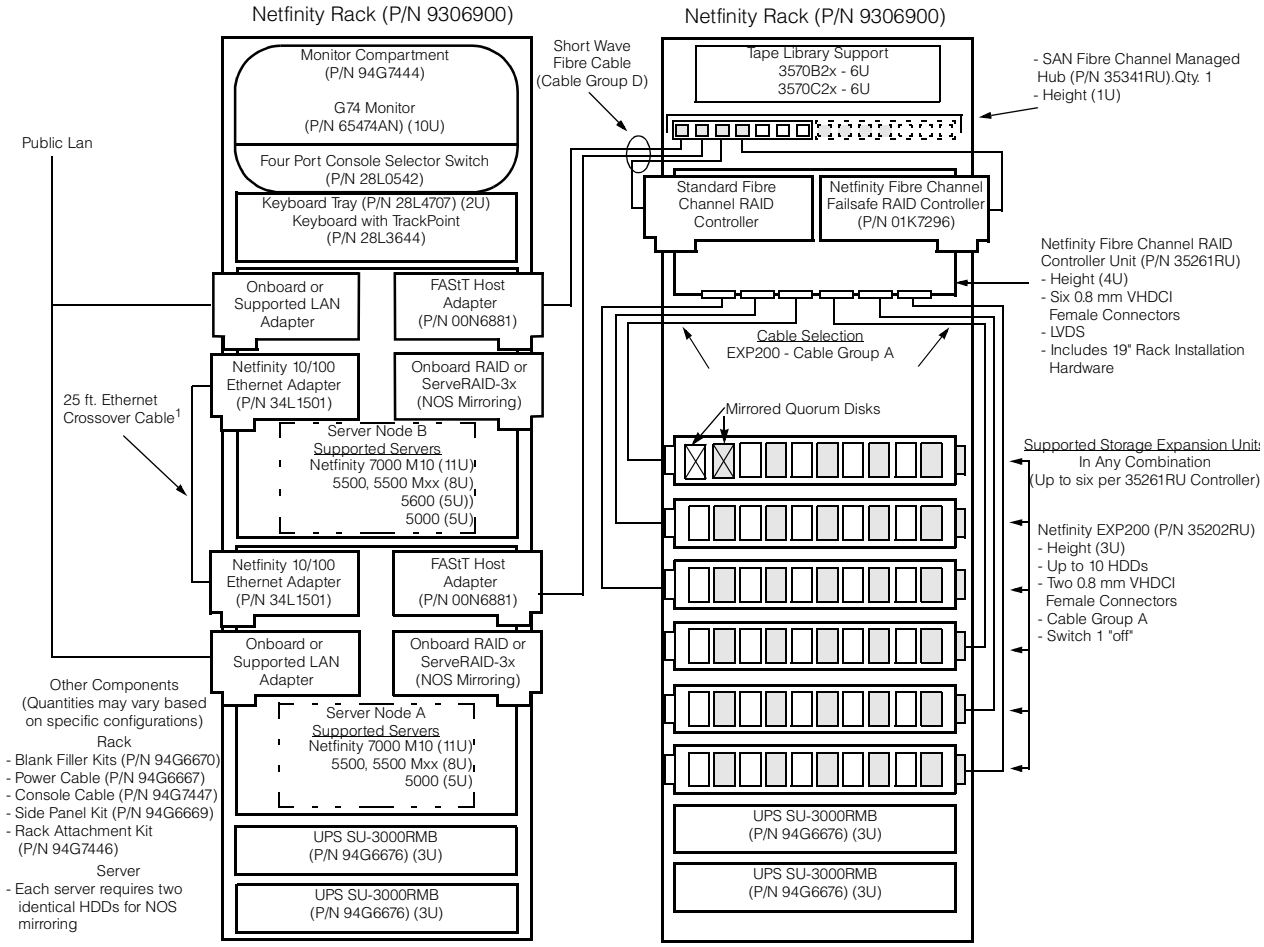
1. Four Netfinity Fibre channel Short-Wave GBIC's (P/N 03K9308) are included with SAN Fibre Channel Managed Hub (P/N 35341RU).

IBM Netfinity Fibre Array Solutions

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements

Cluster Solution

High speed multiple node Microsoft Cluster Service (MSCS) and Netfinity Fibre Channel Storage configuration offering data protection and RAID redundancy.


Netfinity Rack (P/N 9306900)
Netfinity Rack (P/N 9306900)
Monitor Compartment (P/N 94G7444)
G74 Monitor (P/N 65474AN) (10U)
Four Port Console Selector Switch (P/N 28L0542)
Keyboard Tray (P/N 28L4707) (2U)
Keyboard with TrackPoint (P/N 28L3644)
Short Wave Fibre Cable (Cable Group D)
Tape Library Support 3570B2x - 6U 3570C2x - 6U
- SAN Fibre Channel Managed Hub (P/N 35341RU).Qty. 1
- Height (1U)
Public Lan
Standard Fibre Channel RAID Controller
Netfinity Fibre Channel Failsafe RAID Controller (P/N 01K7296)
Netfinity Fibre Channel RAID Controller Unit (P/N 35261RU)
- Height (4U)
- Six 0.8 mm VHDCI Female Connectors
- LVDS
- Includes 19" Rack Installation Hardware
Onboard or Supported LAN Adapter
FAStT Host Adapter (P/N 00N6881)
Cable Selection
EXP200 - Cable Group A
Netfinity 10/100 Ethernet Adapter (P/N 34L1501)
Onboard RAID or ServeRAID-3x (NOS Mirroring)
25 ft. Ethernet Crossover Cable[1]
Mirrored Quorum Disks
Server Node B
Supported Servers
Netfinity 7000 M10 (11U)
5500, 5500 Mxx (8U)
5600 (5U))
5000 (5U)
Supported Storage Expansion Units
In Any Combination
(Up to six per 35261RU Controller)
Netfinity EXP200 (P/N 35202RU)
- Height (3U)
- Up to 10 HDDs
- Two 0.8 mm VHDCI Female Connectors
- Cable Group A
- Switch 1 "off"
Netfinity 10/100 Ethernet Adapter (P/N 34L1501)
FAStT Host Adapter (P/N 00N6881)
Onboard or Supported LAN Adapter
Onboard RAID or ServeRAID-3x (NOS Mirroring)
Other Components
(Quantities may vary based on specific configurations)
Rack
- Blank Filler Kits (P/N 94G6670)
- Power Cable (P/N 94G6667)
- Console Cable (P/N 94G7447)
- Side Panel Kit (P/N 94G6669)
- Rack Attachment Kit (P/N 94G7446)
Server
- Each server requires two identical HDDs for NOS mirroring
Server Node A
Supported Servers
Netfinity 7000 M10 (11U)
5500, 5500 Mxx (8U)
5000 (5U)
UPS SU-3000RMB (P/N 94G6676) (3U)
UPS SU-3000RMB (P/N 94G6676) (3U)
UPS SU-3000RMB (P/N 94G6676) (3U)
UPS SU-3000RMB (P/N 94G6676) (3U)

Connector Types
68-pin - High Density Connector
0.8 mm - Very High Density Connection Interface VHDCI

Cable Group A (0.8 mm to 0.8 mm)
03K9310 - Netfinity 2 M Ultra2 SCSI Cable
03K9311 - Netfinity 4.2 M Ultra2 SCSI Cable
37L7101 - Netfinity 20 M Ultra2 SCSI Cable

Cable Group D (Short-Wave Fibre)
36L9973 - Netfinity Fibre Channel 1 M Cable
03K9306 - Netfinity Fibre Channel 5 M Cable
03K9305 - Netfinity Fibre Channel 25 M Cable
Customer supplied short-wave cable of up to 500 meters (0.31 miles)

Cable Group E (Long-Wave Fibre)
Customer supplied long-wave cable of up to 10 kilometers (6.2 miles)

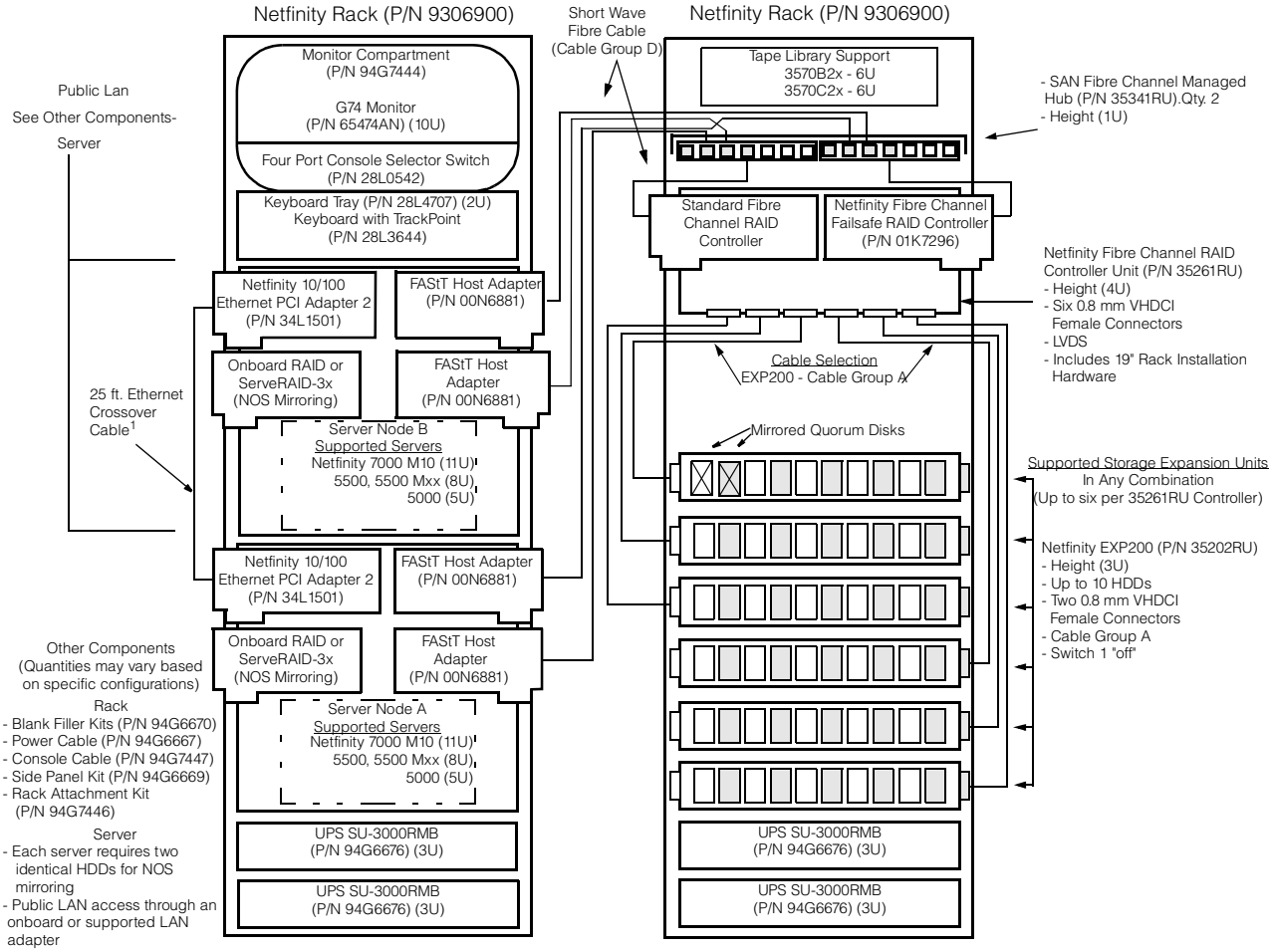
GBIC
03K9308 - Netfinity Fibre Channel Short-Wave GBIC[1]
03K9307 - Netfinity Fibre Channel Long-Wave GBIC

1. Microsoft Cluster Server (MSCS) requires a private interconnect between clustered nodes. A 25 ft. Ethernet crossover cable is shown but not available from IBM as a separate option. Contact your IBM Business Partner for assistance.

IBM Netfinity Fibre Array Solutions

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partne or IBM Marketing Representative for assistance with your specific configuration requirements

Advanced high-speed high-availability multiple node Microsoft Cluster Service (MSCS) and fully redundant Netfinity Fibre Channel Storage configuration offering the highest levels of data protection and availability and access to data

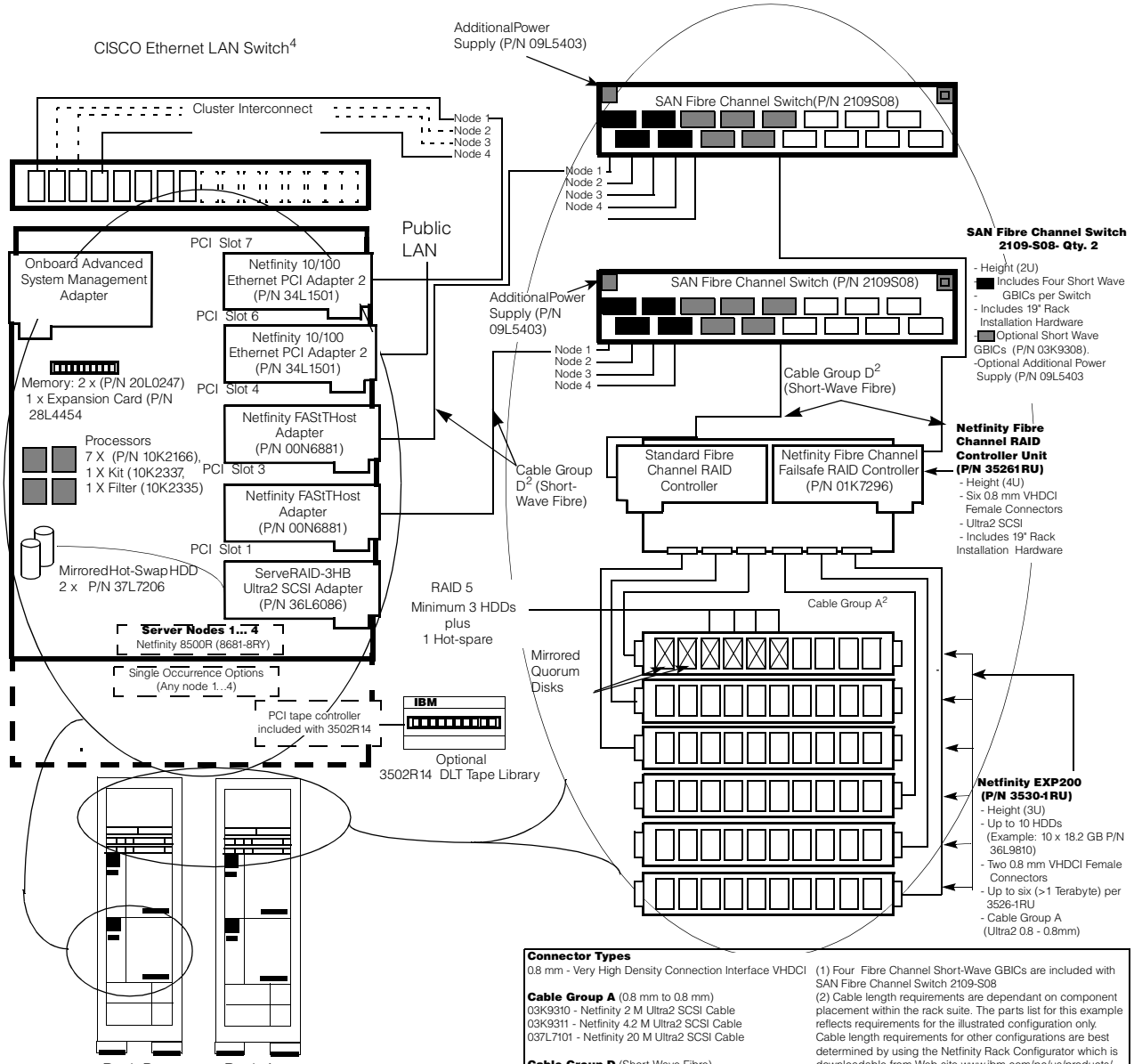

Netfinity Rack (P/N 9306900)
Short Wave Fibre Cable (Cable Group D)
Netfinity Rack (P/N 9306900)
Public Lan
See Other Components-Server
Monitor Compartment (P/N 94G7444)
G74 Monitor (P/N 65474AN) (10U)
Four Port Console Selector Switch (P/N 28L0542)
Keyboard Tray (P/N 28L4707) (2U) Keyboard with TrackPoint (P/N 28L3644)
Netfinity 10/100 Ethernet PCI Adapter 2 (P/N 34L1501)
FAStT Host Adapter (P/N 00N6881)
Onboard RAID or ServeRAID-3x (NOS Mirroring)
FAStT Host Adapter (P/N 00N6881)
25 ft. Ethernet Crossover Cable1
Server Node B
Supported Servers
Netfinity 7000 M10 (11U), 5500, 5500 Mxx (8U), 5000 (5U)
Netfinity 10/100 Ethernet PCI Adapter 2 (P/N 34L1501)
FAStT Host Adapter (P/N 00N6881)
Onboard RAID or ServeRAID-3x (NOS Mirroring)
FAStT Host Adapter (P/N 00N6881)
Server Node A
Supported Servers
Netfinity 7000 M10 (11U), 5500, 5500 Mxx (8U), 5000 (5U)
UPS SU-3000RMB (P/N 94G6676) (3U)
UPS SU-3000RMB (P/N 94G6676) (3U)
Other Components (Quantities may vary based on specific configurations)
Rack
- Blank Filler Kits (P/N 94G6670)
- Power Cable (P/N 94G6667)
- Console Cable (P/N 94G7447)
- Side Panel Kit (P/N 94G6669)
- Rack Attachment Kit (P/N 94G7446)
Server
- Each server requires two identical HDDs for NOS mirroring
- Public LAN access through an onboard or supported LAN adapter
Tape Library Support 3570B2x - 6U 3570C2x - 6U
- SAN Fibre Channel Managed Hub (P/N 35341RU).Qty. 2
- Height (1U)
Standard Fibre Channel RAID Controller
Netfinity Fibre Channel Failsafe RAID Controller (P/N 01K7296)
Netfinity Fibre Channel RAID Controller Unit (P/N 35261RU)
- Height (4U)
- Six 0.8 mm VHDCI Female Connectors
- LVDS
- Includes 19" Rack Installation Hardware
Cable Selection
EXP200 - Cable Group A
Mirrored Quorum Disks
Supported Storage Expansion Units In Any Combination (Up to six per 35261RU Controller)
Netfinity EXP200 (P/N 35202RU)
- Height (3U)
- Up to 10 HDDs
- Two 0.8 mm VHDCI Female Connectors
- Cable Group A
- Switch 1 "off"
UPS SU-3000RMB (P/N 94G6676) (3U)
UPS SU-3000RMB (P/N 94G6676) (3U)

Connector Types 68-pin - High Density Connector 0.8 mm - Very High Density Connection Interface VHDCI	Cable Group D (Short-Wave Fibre) 36L9973 - Netfinity Fibre Channel 1 M Cable 03K9306 - Netfinity Fibre Channel 5 M Cable 03K9305 - Netfinity Fibre Channel 25 M Cable Customer supplied short-wave cable of up to 500 meters (0.31 miles)
Cable Group A (0.8 mm to 0.8 mm) 03K9310 - Netfinity 2 M Ultra2 SCSI Cable 03K9311 - Netfinity 4.2 M Ultra2 SCSI Cable 37L7101 - Netfinity 20 M Ultra2 SCSI Cable	Cable Group E (Long-Wave Fibre) Customer supplied long-wave cable of up to 10 kilometers (6.2 miles) GBIC 03K9308 - Netfinity Fibre Channel Short-Wave GBIC[1] 03K9307 - Netfinity Fibre Channel Long-Wave GBIC

1. Microsoft Cluster Server (MSCS) requires a private interconnect between clustered nodes. A 25 ft. Ethernet crossover cable is shown but not available from IBM as a separate option. Contact your IBM Business Partner for assistance.

Netfinity Availability Extensions for NT 4.0 MSCS Four Node Cluster

Note: - The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Customer specific MSCS configurations require IBM approval. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.


CISCO Ethernet LAN Switch[4]
AdditionalPower Supply (P/N 09L5403)
SAN Fibre Channel Switch(P/N 2109S08)
Cluster Interconnect
Node 1
Node 2
Node 3
Node 4
Public LAN
PCI Slot 7
Onboard Advanced System Management Adapter
Netfinity 10/100 Ethernet PCI Adapter 2 (P/N 34L1501)
PCI Slot 6
Netfinity 10/100 Ethernet PCI Adapter 2 (P/N 34L1501)
PCI Slot 4
Memory: 2 x (P/N 20L0247) 1 x Expansion Card (P/N 28L4454
Processors 7 X (P/N 10K2166), 1 X Kit (10K2337, 1 X Filter (10K2335)
PCI Slot 3
Netfinity FAStTHost Adapter (P/N 00N6881)
Netfinity FAStTHost Adapter (P/N 00N6881)
PCI Slot 1
MirroredHot-SwapHDD 2 x P/N 37L7206
ServeRAID-3HB Ultra2 SCSI Adapter (P/N 36L6086)
Server Nodes 1... 4
Netfinity 8500R (8681-8RY)
Single Occurrence Options (Any node 1...4)
PCI tape controller included with 3502R14
IBM
Optional 3502R14 DLT Tape Library
AdditionalPower Supply (P/N 09L5403)
SAN Fibre Channel Switch (P/N 2109S08)
Cable Group D2 (Short-Wave Fibre)
Cable Group D2 (Short-Wave Fibre)
Standard Fibre Channel RAID Controller
Netfinity Fibre Channel Failsafe RAID Controller (P/N 01K7296)
RAID 5
Minimum 3 HDDs plus 1 Hot-spare
Mirrored Quorum Disks
Cable Group A2
SAN Fibre Channel Switch 2109-S08- Qty. 2
- Height (2U)
- Includes Four Short Wave GBICs per Switch
- Includes 19" Rack Installation Hardware
- Optional Short Wave GBICs (P/N 03K9308).
-Optional Additional Power Supply (P/N 09L5403
Netfinity Fibre Channel RAID Controller Unit (P/N 35261RU)
- Height (4U)
- Six 0.8 mm VHDCI Female Connectors
- Ultra2 SCSI
- Includes 19" Rack Installation Hardware
Netfinity EXP200 (P/N 3530-1RU)
- Height (3U)
- Up to 10 HDDs (Example: 10 x 18.2 GB P/N 36L9810)
- Two 0.8 mm VHDCI Female Connectors
- Up to six (>1 Terabyte) per 3526-1RU
- Cable Group A (Ultra2 0.8 - 0.8mm)

Rack B	Rack A
3502 Tape	RAID Controller
FC Switch	EXP200
FC Switch	EXP200
EXP200	EXP200
EXP200	8500R
EXP200	Flat Panel Monitor
8500R	Keyboard
8500R	Console Switch
5000 UPS	8500R
5000 UPS	5000 UPS
	5000 UPS

Connector Types
0.8 mm - Very High Density Connection Interface VHDCI

Cable Group A (0.8 mm to 0.8 mm)
03K9310 - Netfinity 2 M Ultra2 SCSI Cable
03K9311 - Netfinity 4.2 M Ultra2 SCSI Cable
037L7101 - Netfinity 20 M Ultra2 SCSI Cable

Cable Group D (Short-Wave Fibre)
03K9306 - Netfinity Fibre Channel 5 M Cable
03K9305 - Netfinity Fibre Channel 25 M Cable
Customer supplied short-wave cable of up to 500 meters (0.31 miles)

GBIC
03K9308 - Netfinity Fibre Channel Short-Wave GBIC[1]
03K9307 - Netfinity Fibre Channel Long-Wave GBIC

(1) Four Fibre Channel Short-Wave GBICs are included with SAN Fibre Channel Switch 2109-S08
(2) Cable length requirements are dependant on component placement within the rack suite. The parts list for this example reflects requirements for the illustrated configuration only. Cable length requirements for other configurations are best determined by using the Netfinity Rack Configurator which is downloadable from Web site www.ibm.com/pc/us/products/server/download.html
(3) A tape library is optional and attaches to any one of the nodes within the cluster.
(4) Please contact your NAE Specialist in Advanced Technical Support about the most up-to-date Cluster interconnect requirements.

Additional Information and Configuration Tools Available
See "Information Sources" section for Clustering, Server Paper Configurator, ConfigXpert and Netfinity Rack Configurator URLs

Netfinity Availability Extensions for NT4.0 MSCS Four Node Cluster - Parts List[1]

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Customer specific MSCS configurations require IBM approval. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

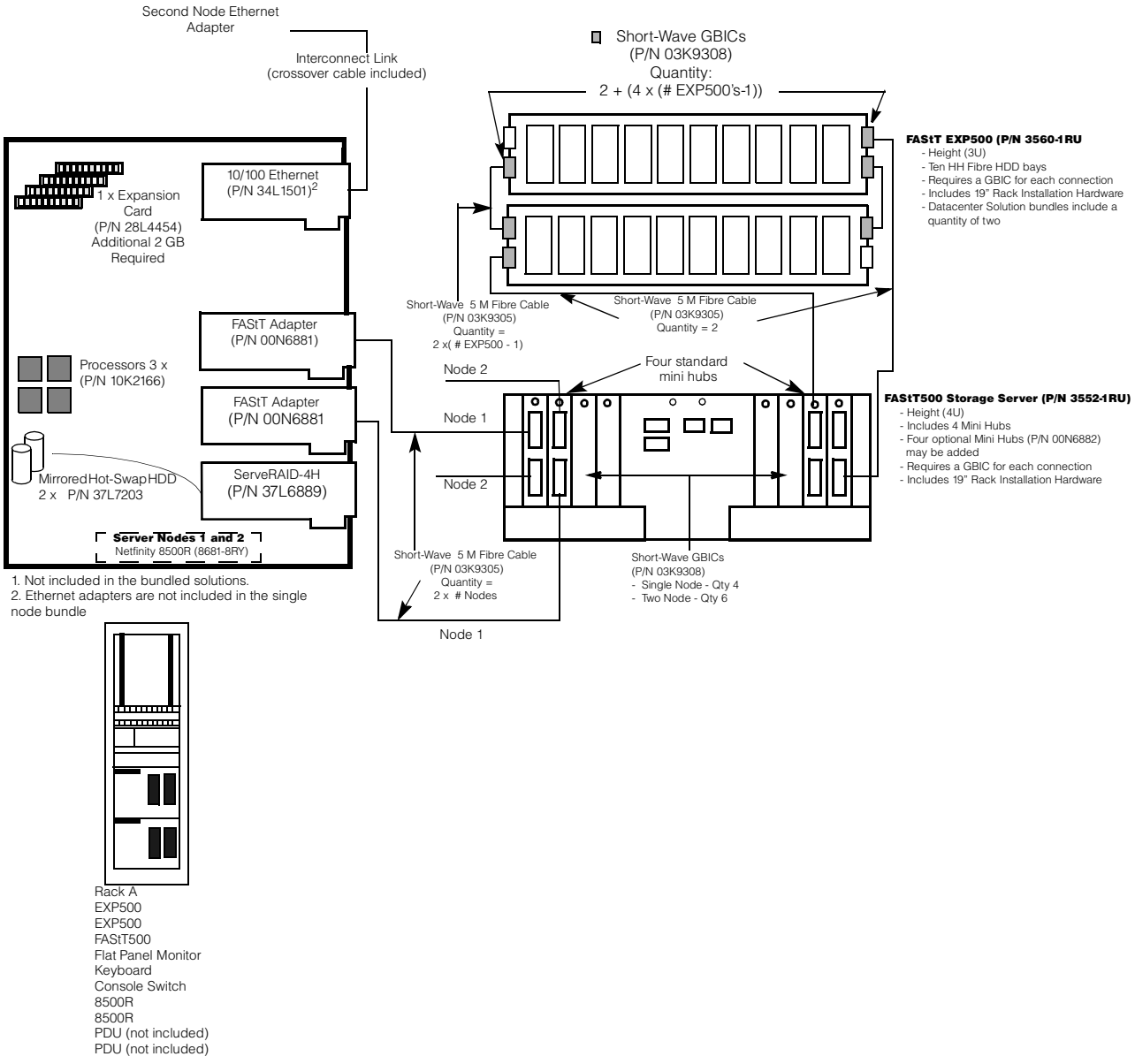
Part Number	Description	Qty.	Usage
86818RY	Netfinity 8500R-700 MHz/2 Mb L2, 512k Mb RAM	4	Cluster Nodes
10K2335	Netfinity 4x Accelerator Filter	4	
10K2337	Netfinity Mezzanine Expansion Kit	4	Allows expansion to 8 SMP processors.
10K2166	Netfinity 8500R 700 MHz/ 2 Mb Upgrade with Pentium III Xeon Processor	28	7 per node, total of 8 SMP processors per node
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	8	2 per node, mirrored NOS, attached to ServeRAID
36L6086	IBM Netfinity ServeRAID-3HB Ultra2 SCSI Adapter	4	1 per node for NOS HDDs. Install in PCI slot 1
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	8	Public LAN - slot 6/ interconnect slot 7
00N6881	Netfinity FAStT Host Adapter	8	2 per node, each attaches to one of the two Fibre Hubs. Install in PCI slots 3 and 4.
37L0075	Netfinity EXP200 350 W Redundant Power Supply II	4	1 per node, provides power supply redundancy for each node
20L0247	256 MB ECC SDRAM RDIMM II Memory	8	2 per node to increase memory to 1GB
28L4454	Netfinity Memory Expansion Card	4	1 per node, to expand for additional memory
02K6545	UltraSlim 56 W AC Adapter	4	Provides an independent backup power source for systems management
	Storage Subsystems		
2109S08	SAN Fibre Channel 8 Port Switch	2	Redundant short-wave (SW) connections from each of four nodes to Netfinity Fibre Channel RAID Controller Unit. Each switch includes four standard SW BBICs
09L5403	Additional Power Supply	2	Hot-Swap redundant power supply for SAN Fibre Channel Switch
03K9308	Netfinity Fibre Channel Short-Wave GBIC	10	8 for adapters and 2 for switches
3526-1RU	Netfinity Fibre Channel RAID Controller Unit	1	Attaches to 6 EXP200s, with Failsafe Controller - two attachments to the hubs
01K7296	Netfinity Fibre Channel Failsafe RAID Controller	1	Installs in Controller Unit, providesredundant path to EXP200s
3530-1RU	Netfinity EXP200 Storage Expansion Unit	6	One LVDS attachment to RAID Controller Unit per EXP200, max, of 60 HDDs
36L9750	Netfinity EXP 36,4 GB 10K-3 Wide Ultra SCSI Hot-Swap HDD	58	A minimum of four RAID 5 HDDs(3 plus a hot-spare) with a maximum of 58
36L9809	Netfinity EXP 9.1 GB 10K-3 Wide Ultra SCSI Hot-Swap HDD	2	Mirrored Quorum HDDs
3502R14	DLT Tape Library	1	Tape subsystems are optional. The 3502R14 includes a 3 M cable and PCI controller
37L6861	APC Smart-UPS 5000RMB[2]	4	Power connections are intra-rack only[2]
	Storage Cables		
03K9306	Netfinity Fibre Channel 5 M Cable	10	2 x 4 nodes to hub, 2 hub to RAID controllers
03K9310	Netfinity 2 M Ultra2 SCSI Cable	3	RAID controller to EXP200s
03K9311	Netfinity 4.2 M Ultra2 SCSI Cable	3	RAID controller to EXP200s
	Internet Components		
	CISCO Ethernet Switch[4]	1	Standard configuration supports interconnection up to 4 nodes
92G9320	Standard CAT5 Cables	8	2 per node for cluster interconnect/network access
	Other Non-Rack		
Customer Supplied	Ethernet System Management Cables	8	Provides interconnection between Advanced System Management Adapters.
28L3644	Space Saver II Keyboard (1U)	1	Includes TrackPoint
9511AG1	Flat Panel Monitor	1	
37L6888	Flat Panel Monitor Adapter	1	
	Rack / Related		
930842P	Netfinity Enterprise Rack	1	Provides 42U of mounting space per rack
930842X	Netfinity Enterprise Expansion Cabinet	1	Provides 42U of additional mounting space
28L4707	Netfinity Rack Keyboard Tray	1	Allows keyboard 28L3640 to be stowed in a ready-to-use position
28L0542	Netfinity Console Selector Switch (4-port)	1	Connects 4 nodes to 4-port switch
94G7448	Power Cable - TypeC12	15	Provides power cables for UPS attachment to installed components
94G7447	NetBAY 12ft. Console Cable Set	4	Attaches each node to the console switch.

	Netfinity Availability Extensions for MSCS[3]		
36L9891	Netfinity Availability Extensions for MSCS (3 node)[5]	1	License for first 3 nodes
36L9892	Netfinity Availabilty Extensions for MSCS (1 additional node)[5]	1	License for last additional node (4th)

1. Cable, power, cooling and weight are dependent on component placement within the rack and rack suite. This parts list reflects one possible configuration of the listed components. Prior to ordering, you should configure your specific environment using the Netfinity Rack Configurator. The Netfinity Rack Configurator is downloadable from URL www.ibm.com/pc/us/products/server/download.html.
2. Pre-installation site planning information:34L6861 contains four L6-30P, 220V 30 amp circuitry.
3. Consists of Netfinity Availability Extensions for MSCS software licenses (support for up to four nodes) and installation services for the complete Netfinity solution being installed. Netfinity Availabilty Extensions for MSCS is available through IBM Direct as a solution offering and is designed for installation by trained service personnel. Please contact your IBM representative for ordering information.
4. Please contact your IBM representative about the most up-to-date Cluster Interconnect requirements.
5. Netfinity Availability Extensions for MSCS(NAE) require NAE Service Pack 3.

Datacenter Solutions

Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements


Second Node Ethernet Adapter
Interconnect Link (crossover cable included)
Short-Wave GBICs (P/N 03K9308) Quantity: 2 + (4 x (# EXP500's-1))
FAStT EXP500 (P/N 3560-1RU
- Height (3U)
- Ten HH Fibre HDD bays
- Requires a GBIC for each connection
- Includes 19" Rack Installation Hardware
- Datacenter Solution bundles include a quantity of two
10/100 Ethernet (P/N 34L1501)2
1 x Expansion Card (P/N 28L4454) Additional 2 GB Required
FAStT Adapter (P/N 00N6881)
Processors 3 x (P/N 10K2166)
FAStT Adapter (P/N 00N6881
Mirrored Hot-Swap HDD 2 x P/N 37L7203
ServeRAID-4H (P/N 37L6889)
Server Nodes 1 and 2
Netfinity 8500R (8681-8RY)
Short-Wave 5 M Fibre Cable (P/N 03K9305) Quantity = 2 x(# EXP500 - 1)
Short-Wave 5 M Fibre Cable (P/N 03K9305) Quantity = 2
Node 2
Four standard mini hubs
Node 1
Node 2
FAStT500 Storage Server (P/N 3552-1RU)
- Height (4U)
- Includes 4 Mini Hubs
- Four optional Mini Hubs (P/N 00N6882) may be added
- Requires a GBIC for each connection
- Includes 19" Rack Installation Hardware
Short-Wave 5 M Fibre Cable (P/N 03K9305) Quantity = 2 x # Nodes
Short-Wave GBICs (P/N 03K9308)
- Single Node - Qty 4
- Two Node - Qty 6
Node 1
1. Not included in the bundled solutions.
2. Ethernet adapters are not included in the single node bundle
Rack A
EXP500
EXP500
FAStT500
Flat Panel Monitor
Keyboard
Console Switch
8500R
8500R
PDU (not included)
PDU (not included)

IBM Datacenter Solution - Single Node (P/N 21P9961)

Bundle (P/N 21P9961) Components	IBM Datacenter Solution - Single Node (P/N 21P9961) includes the part numbers and quantities identified in this table. Required options must be purchased separately and are identified in the table labeled "Required Options". Additional options for IBM Datacenter Solutions are listed in the table labeled "Selectable Options". All final customer configurations and solutions require IBM Solution Assurance Approval.			Warranty Service 24x7x4 hrs	Warranty Service 24x7x2 hrs[1]
Part Number	**Description**	**Qty**	**Usage**	**Part Number**	**Part Number**
	Server Node 1				
8681-8RY	Netfinity 8500R 700/2MB, 512MB ECC, OPEN, 40X, PCI (Rack (8U)	1		41L2742	41L2743
10K2166	Netfinity 8500R 700MHz/2MB Upgrade with Pentium III Xeon Processor	3	Total of 4 SMP processors per node	N/A	N/A
28L4454	Netfinity 8500R Memory Expansion Card	1	Enables cache line interleaving and requires installation of matched RDIMM pairs.	N/A	N/A
37L6889	ServeRAID-4H Ultra160 SCSI Controller	1	Provides NOS mirroring on internal HDDs.	N/A	N/A
37L7203	36.4GB Ultra160 SCSI Hot-Swap SL HDD.	2	Internal HDDs for NOS installation.	N/A	N/A
00N6881	Netfinity FAStT Host Adapter	2	Redundant paths to external storage subsystems	N/A	N/A
	Storage Subsystems				
35521RU	FAStT500 Storage Server	1	Provides for redundant paths from the server to the storage unit	41L2768	41L2769
35601RU	FAStT EXP500 Storage Expansion Unit	2	HDDs should be added in matched pairs	41L2766	41L2767
	Storage Cables		Calculations assume no switches are installed		
03K9306	Netfinity Fibre Channel 5M Cable	6	Redundant Paths: Nodes - Storage Server - EXP500	N/A	N/A
03K9308	Netfinity Fibre Channel Short-Wave GBIC	10	Redundant Paths: (2 x # Nodes + 4) +4 x (# EXP500's - 1)	N/A	N/A
	Other Non-Rack				
9511AG1	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15" Viewable Image Size), Stealth black	1		30L9183	N/A
28L3644	Space Saver II Keyboard	1		N/A	N/A
	Rack and Related Components				
930842P	Netfinity Enterprise Rack	1		41L2762	41L2763
94G6670	Blank Filler Panel Kit	3	Fills empty front panel space to control air flow	N/A	N/A
28L4707	Netfinity Rack Keyboard Tray	1	Supports Flat Panel Monitor with Kit 37L6888 and stowage of Keyboard 28L3644 in a ready-to-use position.	N/A	N/A
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit II	1	Required for installing flat panel monitor in keyboard tray 28L4707	N/A	N/A
28L0542	Netfinity Console Server Selector Switch (4-port)	1	Attaches up to 4 nodes to a single monitor, keyboard and mouse.	N/A	N/A
94G7447	NetBAY Console Cable Set 12 ft (3.66m)	1	Attaches each node to a Console Server Selector Switch	N/A	N/A
94G7448	Power Cable Type C12 (3.7 m, 12 ft.)	6	Provides IEC 320-C13 (Device) to IEC 320-C14 (Power Unit) power cord	N/A	N/A
	Publications and Software				
22P4745	OS Preload Kit / Ship Group	1		N/A	N/A
	Services				
21P3339	Image Load Fee	1		N/A	N/A
21P3341	Enterprise Rack Prep Fee	1		N/A	N/A
21P3342	Enterprise Rack Installation Fee	4		N/A	N/A

1. This Service offering is not available in all countries and is limited to selected areas (see Fax #8146 on 1-800-IBM-4FAX).

All final customer configurations and solutions require IBM Solution Assurance Approval.

IBM Datacenter Solution - Two Node (P/N 21P9962)

Bundle (P/N 21P9962) Components	IBM Datacenter Solution - Two Node (P/N 21P9962) includes the part numbers and quantities identified in this table. Required options must be purchased separately and are identified in the table labeled "Required Options". Additional options for IBM Datacenter Solutions are listed in the table labeled "Selectable Options". All final customer configurations and solutions require IBM Solution Assurance Approval.				Warranty Service 24x7x4 hrs	Warranty Service 24x7x2 hrs[1]
Part Number	**Description**	**Qty/ Node**	**Total Qty**	**Usage**	**Part Number**	**Part Number**
	Server Nodes 1 and 2					
8681-8RY	Netfinity 8500R 700/2MB, 512MB ECC, OPEN, 40X, PCI (Rack (8U)	1	2		41L2742	41L2743
10K2166	Netfinity 8500R 700MHz/2MB Upgrade with Pentium III Xeon Processor	3	6	Total of 4 SMP processors per node	N/A	N/A
28L4454	Netfinity 8500R Memory Expansion Card	1	2	Enables cache line interleaving and requires installation of matched RDIMM pairs.	N/A	N/A
37L6889	ServeRAID-4H Ultra160 SCSI Controller	1	2	Provides NOS mirroring on internal HDDs.	N/A	N/A
37L7203	36.4GB Ultra160 SCSI Hot-Swap SL HDD.	2	4	Internal HDDs for NOS installation.	N/A	N/A
00N6881	Netfinity FAStT Host Adapter	2	4	Redundant paths to external storage subsystems	N/A	N/A
	Storage Subsystems					
35521RU	FAStT500 Storage Server	-	1		41L2768	41L2769
35601RU	FAStT EXP500 Storage Expansion Unit	-	2		41L2766	41L2767
	Storage Cables			Calculations assume no switches are installed		
03K9306	Netfinity Fibre Channel 5M Cable	-	8	Redundant Paths: Nodes - Storage Server - EXP500	N/A	N/A
03K9308	Netfinity Fibre Channel Short-Wave GBIC	-	12	Redundant Paths: (2 x # Nodes + 4) +4 x (# EXP500's - 1)	N/A	N/A
	Interconnect Components					
19K5788	25 feet Ethernet Crossover Cable	-	1	Interconnects 2 nodes without an Ethernet switch	N/A	N/A
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	1	2	Node to node interconnect	N/A	N/A
	Other Non-Rack					
9511AG1	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15" Viewable Image Size), Stealth black	-	1		30L9183	N/A
28L3644	Space Saver II Keyboard	-	1		N/A	N/A
	Rack and Related Components					
930842P	Netfinity Enterprise Rack	-	1		41L2762	41L2763
94G6670	Blank Filler Panel Kit	-	2	Fills empty front panel space to control air flow	N/A	N/A
28L4707	Netfinity Rack Keyboard Tray	-	1	Supports Flat Panel Monitor with Kit 37L6888 and stowage of Keyboard 28L3644 in a ready-to-use position.	N/A	N/A
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit II	-	1	Required for installing flat panel monitor in keyboard tray 28L4707	N/A	N/A
28L0542	Netfinity Console Server Selector Switch (4-port)	-	1	Attaches up to 4 nodes to a single monitor, keyboard and mouse.	N/A	N/A
94G7447	NetBAY Console Cable Set 12 ft (3.66m)	1	2	Attaches each node to a Console Server Selector Switch	N/A	N/A
94G7448	Power Cable Type C12 (3.7 m, 12 ft.)	-	7	Provides IEC 320-C13 (Device) to IEC 320-C14 (Power Unit) power cord	N/A	N/A
	Publications and Software					
22P4745	OS Preload Kit / Ship Group	1	2		N/A	N/A
	Services					
21P3339	Image Load Fee	1	2		N/A	N/A
21P3341	Enterprise Rack Prep Fee	-	1	Quantity equals the number of racks	N/A	N/A
21P3342	Enterprise Rack Installation Fee	-	5	Quantity equals the number of major rack components installed	N/A	N/A

1. This Service offering is not available in all countries and is limited to selected areas (see Fax #8146 on 1-800-IBM-4FAX).

All final customer configurations and solutions require IBM Solution Assurance Approval.

IBM Datacenter Solution - Required Options

Required Options	Required Options provide alternative methods of meeting minimum memory and storage requirements. Customer requirements will vary, therefore these options are configured and purchased separate from the base solution bundle. All final customer configurations and solutions require IBM Solution Assurance Approval.			Warranty Service 24x7x4 hrs	Warranty Service 24x7x2 hrs[1]
Part Number	**Description**	**Qty/ Node**	**Usage**	**Part Number**	**Part Number**
Select one of the two memory options per node		RDIMMs must be added in matched pairs within each node. A minimum of 2GB must be added to each bundled node.			
33L3056	Netfinity 1 GB SDRAM ECC RDIM II	2 + 2N	Minimum of 2	N/A	N/A
20L0249	Netfinity 512MB SDRAM ECC RDIMM II	4 + 2N	Minimum of 4	N/A	N/A
Select F/C hard file options (multiple of 2) per bundle		A minimum of 2 HDDs must be installed. One in each FAStT500 Storage Expansion Unit. Additional HDDs must be installed in multiples of 2			
19K0652	18.2GB 10K-4 FC Hot-Swap HDD		Install in EXP500s	N/A	N/A
19K0653	36.4GB 10K-4 FC Hot-Swap HDD		Install in EXP500s	N/A	N/A
19K0654	73.4GB 10K-4 FC Hot-Swap HDD		Install in EXP500s	N/A	N/A
Select one of the two Warrany Services per bundle					
24X7X4 option	Use the above applicable P/Ns with the right quantity				
24X7X2 option	Use the above applicable P/Ns with the right quantity				

1. This Service offering is not available in all countries and is limited to selected areas (see Fax #8146 on 1-800-IBM-4FAX).

All final customer configurations and solutions require IBM Solution Assurance Approval.

IBM Datacenter Solution -Selectable Options

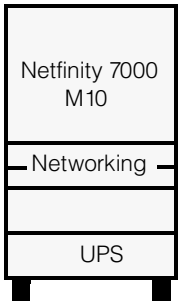
Selectable Options	Selectable options are not required but are compatible for use with IBM Datacenter bundles. A comprehensive list of supported options can be found at www.developer.ibm.com/welcome/netfinity, under 'NEWS' select 'Solutions Library', perform a search for 'Microsoft', click on 'Windows 2000 Datacenter Server'. All final customer configurations and solutions require IBM Solution Assurance Approval.		Warranty Service 24x7x4 hrs	Warranty Service 24x7x2 hrs[1]	Enterprise Rack Assembly Fee
Part Number	**Description**	**Usage**	**Part Number**	**Part Number**	**Part Number**
21P9960[2]	Datacenter Server Bundle-Additional node	Preloaded 8500R for nodes 3 and 4.	41L2742	41L2743	21P3342
10K2166	Netfinity 8500R 700 MHz/2 MB Upgrade with Pentium III Xeon Processor	Netfinity 8500R supports up to 8 SMP processors. Installation of 5 or more requires Filter and Expansion Kits P/N 10K2335 and 10K2337 respectively.	N/A	N/A	N/A
10K2337	Netfinity Mezzanine Expansion Kit	Required for installation of processors 5 through 8. Requires Filter (P/N 10K2335)			
10K2335	Netfinity 4X Accelerator Filter	Required when installing Mezzanine Expansion Kit (P/N 10K2337)			
00N6881	Netfinity FAStT Host Adapter		N/A	N/A	N/A
35521RU	FAStT500 Storage Server		41L2768	41L2769	21P3342
35601RU	FAStT500 Storage Expansion Unit		41L2766	41L2767	21P3342
36L9973	Netfinity Fibre Channel 1 M Cable		N/A	N/A	N/A
03K9306	Netfinity Fibre Channel 5 M Cable		N/A	N/A	N/A
03K9308	Netfinity Fibre Channel Short-Wave GBIC		N/A	N/A	N/A
2109S08	SAN Fibre Channel Switch, 8-port		Standard	N/A	21P3342
09L5403	SAN Switch Redundant Power Supply		N/A	N/A	N/A
2108R3S	SAN Data Gateway Router		N/A	N/A	21P3342
37L6889	ServeRAID-4H Ultra160 SCSI Controller		N/A	N/A	N/A
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2		N/A	N/A	N/A
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN		N/A	N/A	N/A
31L3820	Fast Ethernet on STP Adapter 2.5m Cable	Attachment from ethernet adapter to ethernet switch	N/A	N/A	N/A
34L0301	Netfinity Gigabit Ethernet SX Adapter		N/A	N/A	N/A
31L3820	Fast Ethernet on STP Adapter 2.5m Cable	Attachment from ethernet adapter to ethernet switch	N/A	N/A	N/A
930842P	Netfinity Enterprise Rack		41L2762	41L2763	21P3341
930842X	Netfinity Enterprise Expansion Cabinet		41L2762	41L2763	21P3341
94G7448	Power Cable Type C12 (3.7 m, 12 ft.)	Provides IEC 320-C13 (Device) to IEC 320-C14 (Power Unit) power cord.	N/A	N/A	N/A

94G7450	200-240V Power Distribution Unit		N/A	N/A	N/A
37L6861	APC Smart-UPS 5000 RMB		N/A	N/A	21P3342
3502R14	DLT Tape Library - Rack (includes SCSI Adapter)		41L2747	N/A	21P3342
06P3882[3]	Ethernet Switch	Used for interconnect backup and Public LAN access	N/A	N/A	21P3342
19K5788[3]	25' Ethernet Crossover Cable	Interconnects 2 nodes without an ethernet switch	N/A	N/A	N/A

1. This Service offering is not available in all countries and is limited to selected areas (see Fax #8146 on 1-800-IBM-4FAX).
All final customer configurations and solutions require IBM Solution Assurance Approval.
2. Memory from the Required Options table must be ordered. Additional hardware may also be required, such as an ethernet switch and cables.
3. Available in North America only.

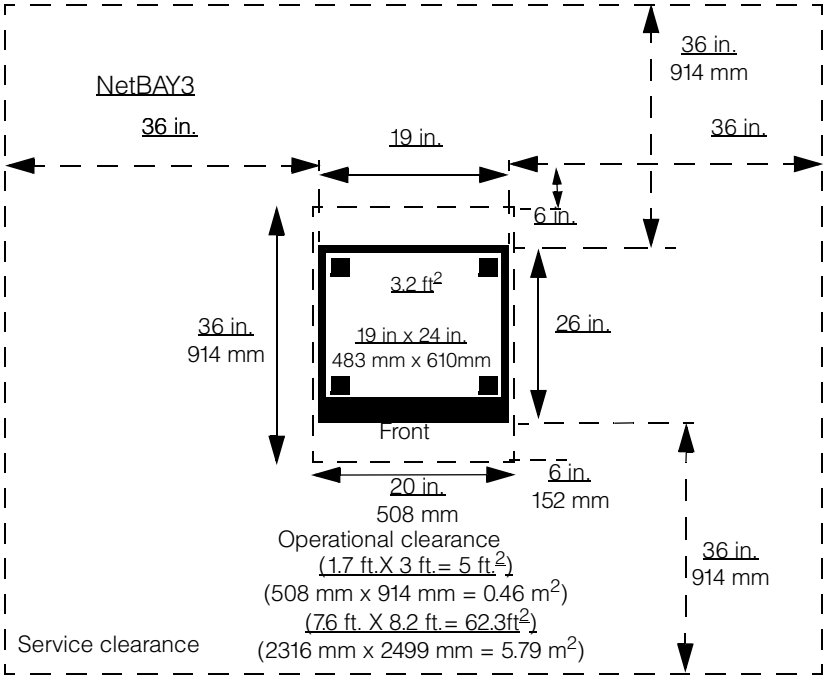
IBM Netfinity NetBAY3/NetBAY3E Stackable Enclosures

Sample Configuration



Installation Guidelines:

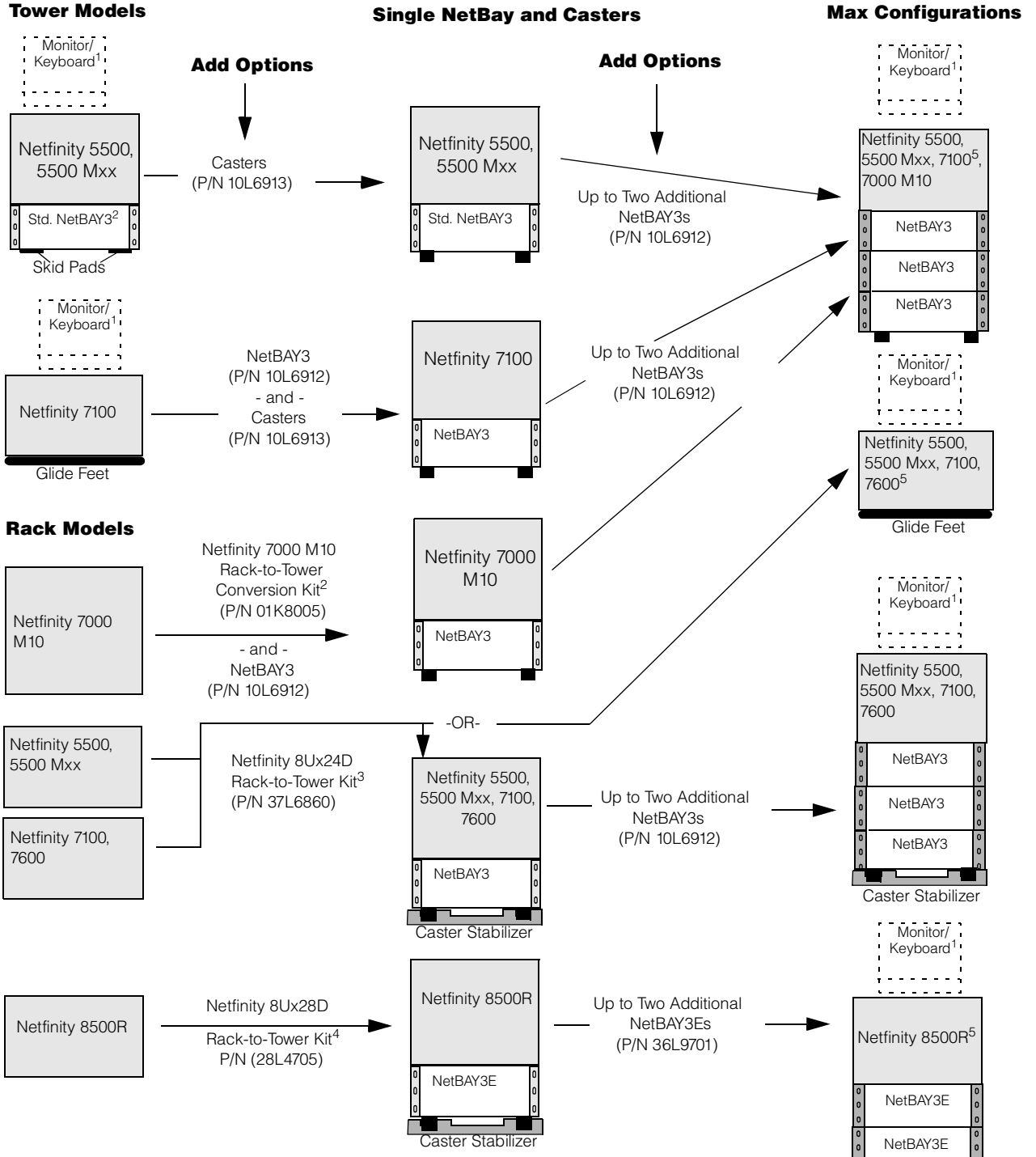
1) Locate power units with line cords in the bottom enclosure.
2) Install components starting from the bottom; start with the heaviest device.
3) If nothing is installed in the enclosure, attach the rear blank panel for stability.



Supported Devices	NetBAY3	NetBAY3E	Size (U)	Weight lb/kg)	Max/Enclosure	Max/Stack
Servers						
Netfinity 7600[1]	X	-	-	120/54.4	n/a	1
Netfinity 7100	X	-	-	120/54.4	n/a	1
Netfinity 7000-M10[1]	X	-	-	160/72.6	n/a	1
Netfinity 5500	X	-	-	120/54.4	n/a	1
Netfinity 5500-Mxx	X	-	-	123.4/56.0	n/a	1
Netfinity 8500R[3]	-	X		170/77.1	n/a	1
Expansion[4]						
Netfinity EXP15	X	X	3	107/48.5	1	3
Tape Units[4]						
NetMEDIA 3551001	X	X	3	37/17	1	3
Power[4]						
APC Smart-UPS 1400RMB	X	X	3	55/24.9	1	1
APC Smart-UPS 3000RMB	X	X	3	112/50.8	1	1
100-120V PDU	X	X	1	5/2.3	1	1
200-240V PDU	X	X	1	8/3.6	1	1
Networking[4]						
2210 Multiprotocol Router	X	X	1, 2	7/3.2, 20/9.1	3, 1	9, 3
8230 T-R Controlled Access Unit	X	X	2	15/6.8	1	3
8235 Dial-in Access to LANs	X	X	1	8/3.6	3	9
8237 Ethernet Hub	X	X	2	10/4.5	1	3
8238 Nways T-R Hub	X	X	2	11/5.0	1	3
8271 Ethernet Switch	X	X	2	16/7.3	1	3
8272 T-R Switch	X	X	2	16/7.3	1	3
8285 ATM Switch	X	X	3	70/31.8	1	3

1. Netfinity 7600 systems are rack mountable and ship without a keyboard. In order to be utilized with a NetBAY3 or in a tower configuration, optional 8Ux28D Rack-to-Tower Kit (P/N 28L4705) must be installed.
2. Netfinity 7000-M10 systems are rack mountable and ship without a keyboard. In order to be utilized with a NetBAY3 or in a tower configuration, optional Rack-to-Tower Conversion Kit (P/N 01K8005) must be installed.
3. Netfinity 8500R systems are rack mountable and ship without a keyboard. In order to be utilized with a NetBAY3E or in a tower configuration, optional Rack-to-Tower Kit (P/N 28L4705) must be installed.
4. NetBAY3 and NetBAY3E do not contain a top cover and therefore require a supported server as the top component in a stack

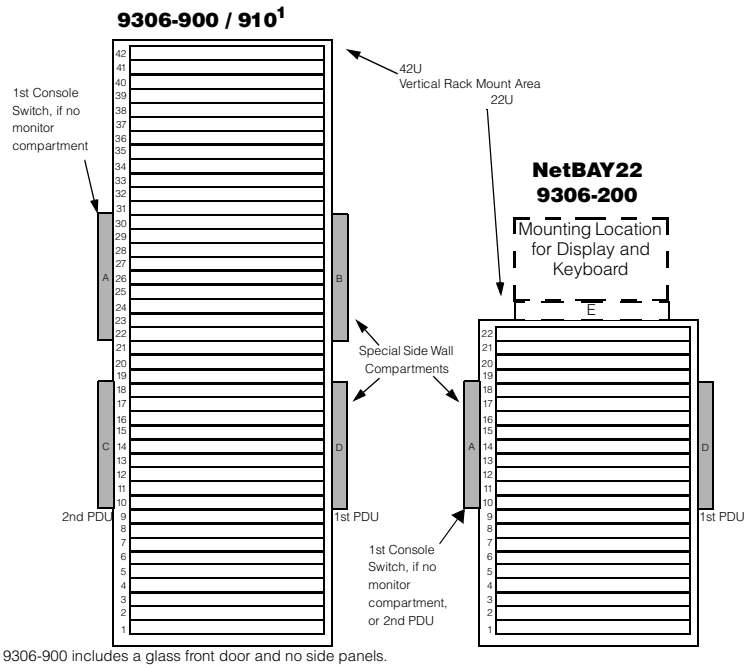
IBM Netfinity NetBAY3/3E Stackable Enclosure



1. Netfinity rack models ship without a keyboard or mouse. Those supported for stacking on a NetBAY3 or NetBAY3E must have a rack-to-tower kit installed.
2. Netfinity 7000 M10 Rack-to-Tower Conversion Kit (P/N 01K8005) includes casters which can also be used with a NetBAY3.
3. Netfinity 8Ux24D Rack-to-Tower Kit (P/N 37L6860) includes casters, caster stabilizer, glide feet and a single NetBAY3. Either NetBAY3 or the glide feet may be utilized but not both.
4. Netfinity 8Ux28D Rack-to-Tower Kit (P/N 28L4705) includes casters, caster stabilizer, and a single NetBAY3E.
5. Netfinity 7100, 7600 and 8500R are not supported for installation with three empty NetBAY enclosures without a caster stabilizer.

IBM Netfinity Rack Cabinet and Options

Note: For a robust rack configurator application access URL http://www.ibm.com/pc/us/products/server/download.html.



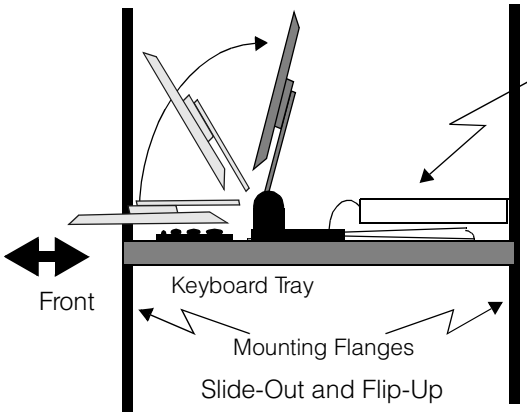
1. 9306-900 includes a glass front door and no side panels.
9306-910 includes a perforated front door and side panels.

Direct Rack Mount[1]: Units Supported		
IBM Servers		
Netfinity 4000R	All Models	1U[3]
xSeries 330	All Models	1U[4]
xSeries 340 / Netfinity 4500R	All Models	3U
xSeries 230 /Netfinity 5100	Rack Models	5U
xSeries 240 / Netfinity 5600	Rack Models	5U
Netfinity 6000R	All Models	4U
Netfinity 7100	Rack Models	8U
Netfinity 7600	All Models	8U
Netfinity 8500R	All Models	8U[2]
IBM Storage Expansion Units		
Netfinity EXP15	3520-2Rx	3U
Netfinity EXP200	35301RU	3U
Netfinity EXP300	35311RU	3U
IBM Fibre Solutions		
RAID Controller Unit	35261RU	4U
FAStT500 Storage Server	35521RU	4U
FAStT EXP500	35601RU	3U
Managed Hub	35341RU	1U
8-port Switch	2109S08	1U
16-port Switch	2109S16	2U
FAStT200	3542xRU	3U
IBM Tape Units		
NetMEDIA	3551001	3U
Magstar MP 3570	3570C21/C22	6U
IBM Networking Products		
Dial-in Access to LANS	8235-03x	1U

1. Mounting hardware provided with product
2. Netfinity 8500R requires installation of extension kit 36L9703 or 36L9702 when installed in a 9306-9xx or 9306-200 respectively for proper rear door closure clearance.
3. To provide adequate cooling, a blank filler panel should be placed on the front of any unused rack space. If non-IBM racks are to be used, assure that both front and rear doors offer approximately 60% open area uniformly distributed and in line with installed servers. A clearance of 51 to 64-mm (2 to 2-1/2 inches) must be maintained between the front door and the system unit's front bezel. The rear door must maintain the same or greater distance. Clearance between the EIA mounting rails and rack side covers must be less than 13-mm (1/2-inch) to prevent air re-circulation from back to front. Non-rack installations are not supported.
4. To provide adequate cooling, Blank Filler Panel Kit (P/N 94G6670) should be placed on the front of any unused rack space. If non-IBM racks are to be used, assure that both front and rear doors offer a minimum of 48% open area uniformly distributed and in line with installed servers. A clearance of 51 to 64-mm (2 to 2-1/2 inches) must be maintained between the front door and the system unit's front bezel. The rear door must maintain the same or greater clearance. Clearance between the EIA mounting rails and the rack side covers must be less than 13-mm (1/2 inch) to prevent air re-circulation from back to front. Non-rack or NetBAY3E installations are not supported.

New Rack Options	
09N4290	NetBAY 1x4 Console Switch
09N4291	NetBAY 2x8 Console Switch
09N4293	NetBAY 7-foot Console Cable Set
37L6865	NetBAY Server Dual Cord Power Distribution Unit
37L6866	NetBAY Rack Power Distribution Unit
37L6883	NetBAY Single Phase Front-End Power Distribution Unit with 120 V line cord
37L6884	NetBAY Single Phase Front-End Power Distribution Unit with 208 V line cord
37L6886	NetBAY Three Phase Front-End Power Distribution Unit with 208 V line cord

Keyboard/Pointer/Monitor & Switch… all in 3U



Console Switch
- Mounts to rear flanges
- Shares 3U space with display, keyboard and tray

Keyboard Tray Components
- 28L4707 Netfinity Rack Keyboard Tray
- 37L6888 Netfinity Flat Panel Monitor Rack Mount Kit II
- 28L3644 Space Saver Keyboard
- 9511AG1 T54A TFT Color Monitor

Optional Accessories

Part Number	Mounting Support	Rack Space	Units Supported
94G7442	Fixed Shelf: width x depth= (439 mm x 663mm) 17.3 in. x 26.1 in max. weight= (45 kg)100lbs.	2 to xx U	IBM Networking Products 8222-008, 016 Nways Enet Wkgp Hub 2U 8225-003 Ethernet Hub 2U
85H6735	Network Products Mounting Kit	1 to 5 U	IBM Networking Products Ethernet Switch 8271-108, 216 2U Ethernet Hub 8237-00x 2U Token-Ring Switch 8272-108 2U Token-Ring Controlled Access Unit 8230-04A, 04P 2U Nways LAN Switch 8270-800 5U Nways Token-Ring Hub 8238-xx1 2U ATM Switch 8285-00B, 00E 3U Multi-Protocol Router 2210-12x 1U Multi-Protocol Router 2210-x4x 2U
36L9702	Netfinity NetBAY22 Rack Extension Kit installs on the rear of a 9306200[1].	-	Netfinity NetBAY22 9306200
36L9703	Netfinity Rack Extension Kit installs on the rear of a 9306900[1].	-	Netfinity Rack 9306900, 9306910
06P6010	Netfinity Rack Front Door Kit	-	Netfinity Rack 9306900

Part Number	Description	Console Support	Devices Supported		
			Devices	Height	Part Number
94G7444	Monitor compartment	One monitor and one console	**Monitors**		
			E51 Color Monitor	9U	633347N
			E54 Color Monitor	9U	6331B2N
			E74 Color Monitor	10U	6332J1N
			G78 Color Monitor	10U	66274AN
			T54A TFT LCD Color Monitor	3U	9511AG1
28L4707	Netfinity Rack Keyboard Tray	One flat panel display and one space saver keyboard, and one keyboard mouse	**Keyboards/Mouses[2]**		
			Space Saver II Keyboard[3, 4]	1U	28L3644
			TrackPoint IV 104-Key[3]	1U	01K1260
			Tower Model Keyboards[5]	1 to 2U	-
			Monitors		
			T54A TFT LCD Color Monitor[6]	-	9511AG1
			Flat Panel Monitor Mount Kit[7]	3U	37L6857
37L6888	Flat Panel Monitor Rack Moun Kit II	Supports installation of a flat panel monitor into tray 28L4707	**Monitors**		
			T54A TFT LCD Color Monitor	-	9511AG1

94G7445	Console Server Selector Switch (8-port, Tier up to 64)	Mounts behind monitor compartment or in rack side When used with keyboard tray 28L4707 and flat panel kit 37L6857 it can also be installed behind the keyboard tray.	Console Cable Set - 12ft. (366 m)	-	94G7447
28L0542	Netfinity Console Server Selector Switch (4-port)				
94G7447	Console Cable Set- (3.66 m) 12 ft.	Attaches server to console switch	Console Server Selector Switch (8-port)	-	94G7445
			Netfinity Console Server Selector Switch (4-port)	-	28L0542

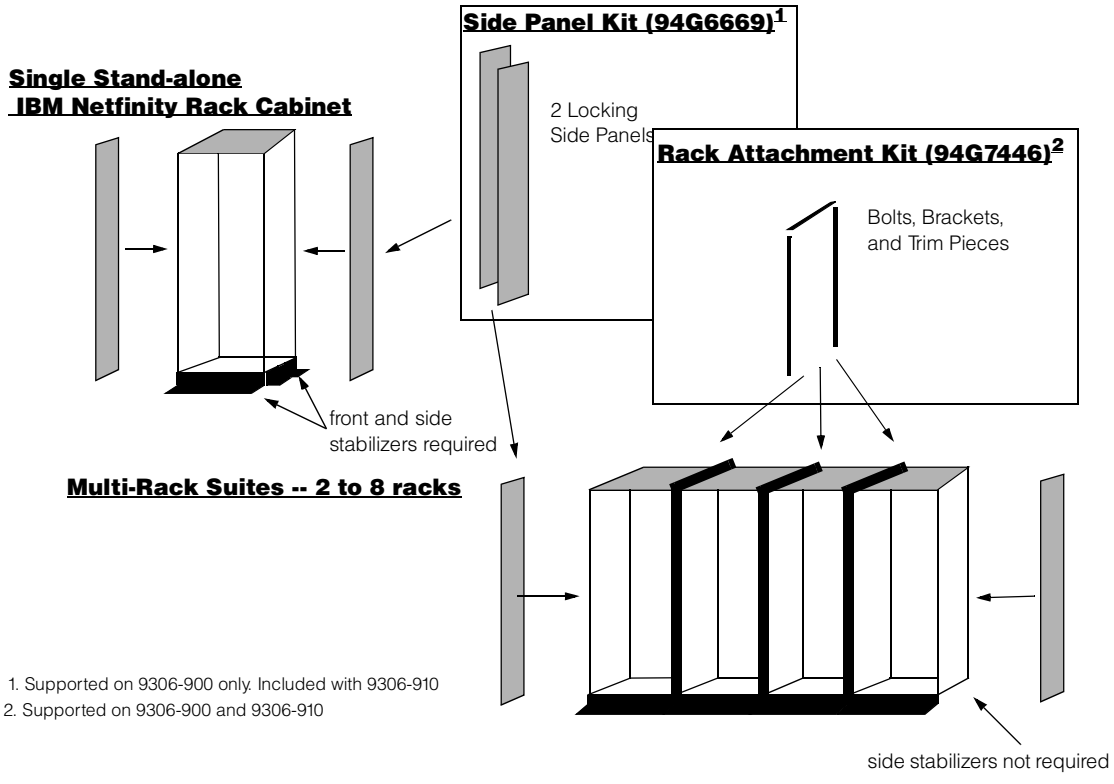
1.Expands current racks for better cable management or to accommodate systems requiring greater installation depth.
2. Check system sections for support of desired keyboards, mouse and monitors.
3. Advanced TrackPoint IV features are not supported by Netfinity servers or rack console switches.
4. Space saver keyboards may be stowed in a ready-to-use position within tray 28L4707.
5. Tower models of Netfinity servers includes keyboards, which are supported by both keyboard trays and console switches. These are not space saver keyboards.
6. Installation in a Netfinity Rack Keyboard Tray (P/N 28L4707) requires Netfinity Flat Panel Monitor Rack Mount Kit II (P/N 37L6888). A space saver keyboard may coexist within the same 28L4707 keyboard tray.
7. When installed in Netfinity Rack Keyboard Tray (P/N 28L4707) a flat panel monitor and space saver keyboard may coexist in the tray. Hardware is included for mounting a console selector switch to the rack directly to the rear of the tray thus sharing the same 3U space. See the Keyboard/Pointer/Monitor & Switch diagram above.

Part Number	Power Support	Rack Space	Comments
94G6666[1]	100-120V 12a Power Distribution Unit	--	8 NEMA 5-15R outlets Mounts in rack side wall D,C
94G7450[2]	200-240V 16a Power Distribution Unit	--	10 IEC 320-C13 outlets Mounts in rack side wall D,C
94G6674[1] 94G6675	1400VA UPS 120V US/C/LA 220-240V EMEA/AP	3U	6 NEMA 5-15R outlets 4 IEC 320-C13 outlets
94G6676[3] 94G6677	3000VA UPS 120V US/C/LA 120-240V EMEA/AP	3U	8 NEMA 5-15R outlets 8 IEC 320-C13 and 1 C19
	Power Cables Type Connectors		Length
94G6667	A14 IEC 320-C13 to NEMA 5-15P	-	(4.27 m) 14 ft.
94G7448	C12 IEC 320-C13 to IEC 320-C14	-	(3.66 m) 12 ft.

Part Number	Miscellaneous	Rack Space	Comments
94G6670	Blank Filler Panel Kit 1U panel (qty. = 2) 3U panel (qty. =1) 5U panel (qty. = 1)	1U + 1U 3U 5U	Use as required to fill empty space in the vertical rack mount area.

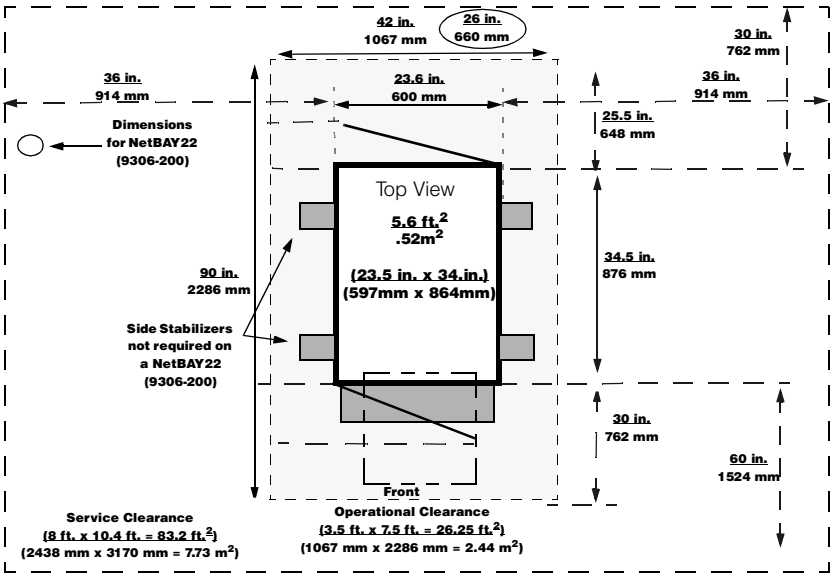
Note: You can select up to two power units per rack. Select the optional Power Cables when the standard cable is not long enough or has incompatible power plug.
1. Requires L5-15R receptacle.
2. Requires 320-C19 receptacle.
3. Requires L5-30R receptacle.

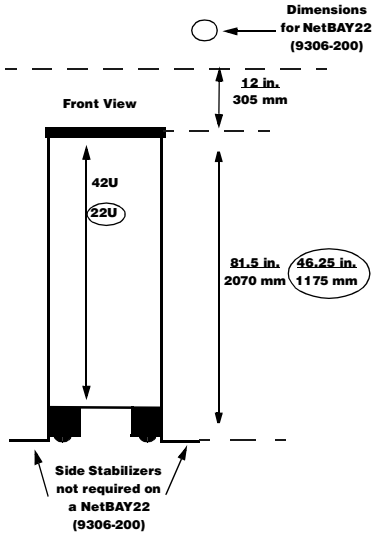
9306-900 Single Cabinet or Multi-Rack Suite Options



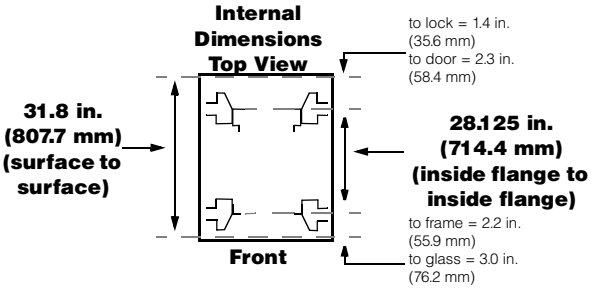
1. Supported on 9306-900 only. Included with 9306-910
2. Supported on 9306-900 and 9306-910

Netfinity Rack - Cabinet and Options Dimensions 9306-900 and NetBAY22 (9306-200)

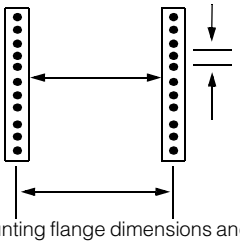




	9306-900		9306-200
Weight (lb/kg)	**Moveable**	**Stationary**	**Moveable or Stationary**
Empty rack	276/125	276/125	182/83
Max load	824/374	1424/646	746/338
Total	1100/499	1700/771	928/421



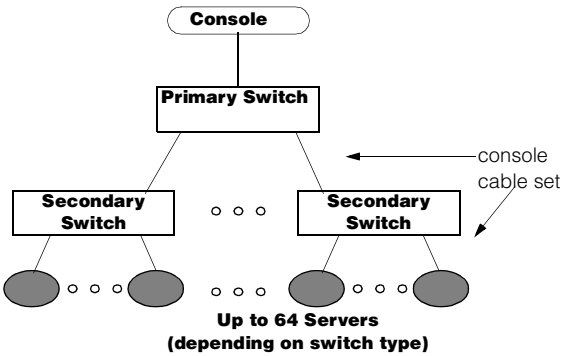
EIA 310-D standard 19-inch,
type A cabinet
1U = (44.45 mm)1.75 inches



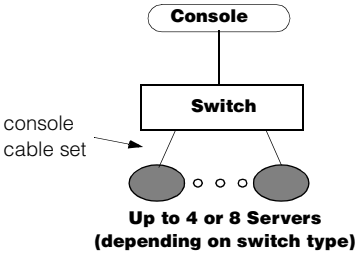
Mounting flange dimensions and
universal hole spacing defined
by EIA 310 for 19-inch racks

Switch Arrangements

Tiering



Single Switch



Appendix A: Tape Drive Attributes

SCSI Interface

LEGEND
HH: Half High - approx. height of 1.6"
SL: Slim Line - approx. height of 1"
FH: Full High

Part Number	Description	SCSI Interface (bit)	Form Factor	Max GB-Native/Compr.[2]	MB/sec - Native/compr.[2]	Termination Incl.	68/50-pin Converter Incl.	Internal Cables	Data/Cleaning Cartridges Included	Ext. Tape Enclosures[1]
09N4041	12/24 GB DDS/3 4-mm Internal SCSI Tape Drive	8	89 mm (3.5") HH or 133 mm (5.25") HH	12/24	1.1/2.2	Y	Y	-	1/1	3510020, 3551001
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	20/40	2.75/5.5	Y	N/A	-	1/1	3510020, 3551001[3]
09N4042	10/20 GB NS Internal SCSI Tape Drive	8	89 mm (3.5") SL or 133 mm (5.25") HH	10/20	1/2	Y	Y	-	1/0	3510020, 3551001
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive	16	133 mm (5.25") HH	20/40	3/6	N	N/A	-	1/1	3510020[4], 3551001
09N4040	20/40 GB DLT Internal SCSI Tape Drive	8	133 mm (5.25") FH	20/40	1.5/3	N	Y	-	1/1	3503BOX[4], 3551001
00N7990	40/80 GB DLT Internal SCSI Tape Drive	16 Ultra2 LVD	133 mm (5.25") FH	40/80	6/10	N	N/A	-	1/1	3503B0X[4], 3551001[3]
00N8017	60/180 GB 8-mm M2 SCSI Tape Drive	16 Ultra2 LVD	133 mm (5.25") HH	60/120	12/24	N	N/A	-	1[13]	3551001[3], 3510020[4]
00N8016	100/200GB LTO Tape Drive	16 Ultra2 LVD	133 mm (5.25") FH	100/200	15/30	N	N/A	-	1/1	3551001[3]
	Associated Options									
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	16 LVD/SE	Ext.	-	-	Y	N	-	-	3510020, 3503B0X
94G7587	PC Server SCSI Terminator Kit	8/16	Int.	-	-	Y	N	-	-	-
36L9636	Netfinity Two-Drop Internal SCSI Cable[6]	16	Int.	-	-	Y	N	16-bit, 2 drop	-	-
10K2340	Media Bay Tray and LVD Cable Kit[7]	16 LVD	Int.	-	-	Y	N	16-bit 2 drop	-	3551001
	Tape Autoloaders									
3502108	DLT Tape Autoloader	16	Desktop	280/560	5/10	Y	-	-	1/1	-
00N7992	120/240 GB DDS/4 Tape Autoloader	16 Ultra2 LVD	133 mm (5.25") FH	120/240	3/6	N	N	-	5/1	3551001
	External Tape Enclosures									
3510020	External Half High SCSI Storage Enclosure[8]	8/16	Desktop	-	-	N	N	8-bit or 16-bit	-	-
3551001	NetMEDIA Storage Expansion Unit EL[9]	16	Rack	-	-	Y	N	2 x 16-bit, 4-drop	-	-
10L7113	NetMEDIA Systems Management Adapter[10]	16	-	-	-	N	N	N	-	3551001
3503B0X	DLT External SCSI Enclosure[11]	16	Desktop	-	-	N	N	16-bit	-	-
	External Tape Libraries[12]									
3502x14	DLT Tape Library	16	Desktop or Rack	490/980	5/10	Y	-	-	1/1	-
3570xxx	Magstar MP 3570 Tape Subsystem	Diff.	Rack	100/300	2.2/6.6 or 7.0/15.0	Y	-	-	1/1	-

1. To determine cable requirements, note the tape drive's SCSI interface, the appropriate SCSI controller from the system configurator section and the desired enclosure then refer to Appendix D: Cables-Storage Units-Controllers.
2. Data compression typically provides a 2X improvement in capacity and transfer rate, but since data compression is affected by many factors, actual improvements may be more or less than 2X.
3. LVD support for LVD devices installed in a NetMEDIA Storage Expansion Unit EL (P/N 3551001) requires replacement of the standard single-ended internal cables with one or more (depending on configuration) cables from Media Bay Tray and LVD Cable Kit (P/N 10K2340) which contains a single two-drop multi-mode terminated cable. If the standard cables are used for attachment to LVD devices, single-ended SCSI rules and bus speeds apply.
4. Requires 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
5. Requires installation of the multi-mode terminated LVD cable from Media Bay Tray and LVD Cable Kit (P/N 10K2340).
6. Netfinity Two-Drop Internal SCSI Cable (P/N 36L9636) is a single-ended wide two-drop terminated cable.
7. Media Bay Tray and LVD Cable Kit (P/N 10K2340) includes an internal two-drop multi-mode terminated LVD SCSI cable.
8. Provides a black desktop 5.25" half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
9. NetMEDIA Storage Expansion Unit EL (P/N 3551001) is a black 3U, 19" rack or NetBAY3/3E mountable tape enclosure which includes two full high (FH) or four half-high (HH) extended length 5.25" bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included.
10. NetMEDIA Systems Management Adapter (P/N 10L7113) may be installed in a 3551001 to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the 3551001 is powered off. External connector is 0.8-mm VHDCI.
11. Provides a black desktop DLT tape enclosure, with a 68-pin high density external connector. Requires termination by the tape drive or by installation of 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
12. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
13. A combination data/clean cartridge cleans the drive each time the data cartridge is used.

Note: Tape support varies by system depending on internal bay availability, SCSI cabling type, number of cable drops, existence of a RAID controller and availability of a suitable external enclosure. The following general rules should be followed.
a) Tapes are not supported for attachment to RAID controllers.
b) Single-ended (non-LVD) devices may be attached to internal multi-mode terminated cables. The entire SCSI bus will be limited to single-ended operation with a maximum bus speed of Ultra-SCSI.
c) LVD devices attached to single-ended terminated cables will operate in single-ended mode with a maximum bus speed of Ultra-SCSI.

Internal SCSI Cables and Optional SCSI Adapters
Most systems support the following SCSI adapters for use with tape. Consult the I/O Options table in the system sections for specific system support. Where tapes are supported internal to the system, the cables which ship with the adapters are supported for tape attachment. Some restrictions may apply based on cable and tape type which are explaned in the note above.

Part Number	Description	Cable Description
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Four-drop, single-ended terminated, 16-bit
19K4646	PCI Wide Ultra160 SCSI Adapter	Five-drop, multi-mode terminated
36L9636	Netfinity Two-Drop Internal SCSI Cable	Two-drop, single-ended terminated, 16-bit
10K2340	Media Bay Tray and LVD Cable Kit	Two-drop, multi-mode terminated

Appendix B: Tape Library Attributes

SCSI Interface

LEGEND
F: Female - External
M: Male - External
68: 16-bit, 68 pin High Density Connector
Diff: Differential SCSI

Part Number	Description	SCSI Interface	Form Factor	Bezel - (B)lack	Terminator Included	External Cables Incl. (m)	SCSI Controllers Incl.	Data Cartridges std.	Cleaning Cartridges std./max	Cartridge Mags std./max	Qty. of drives - std./max	Max GB-Native/Compressed	MB/sec - Native/comp.[1]
3502314	DLT Tape Library - Tower	M68	Desktop	B	Y	M68-M68 3	Y	1/14	1	2/2	1/3	490/980	5/10
3502R14	DLT Tape Library - Rack[2]	M68	4U Rack	B	Y	M68-M68 3	Y	1/14	1	2/2	1/3	490/980	5/10
33L4979	DLT Library Drive Upgrade[3]	M68	-	-	N	Jumper	N	-	-	-	-	-	5/10
3570C21	Magstar MP 3570 Tape Subsystem[4]	Diff	6U Rack	B	Y	4.5	Y	1/20	1	2/2	1/2	100/300	7.0/15.0
3570C22	Magstar MP 3570 Tape Subsystem[4]	Diff	6U Rack	B	Y	4.5	Y	1/20	1	2/2	2/2[5]	100/300	7.0/15.0
08L6517	3570 Adapter Card Kit[6]	Diff	-	-	Y	4.5	Y	-	-	-	-	-	-
08L6480	Second "C" Drive for C21[7]	Diff	-	-	-	-	N	-	-	-	-	-	7.0/15.0
	Magstar MP Media[8]												
05H2462	Magstar MP Fast Access Linear Tape Cartridge, B-format[9]	-	-	-	-	-	-	-	-	-	-	-	-
05H2463	Magstar MP Cleaning Cartridge	-	-	-	-	-	-	-	-	-	-	-	-
08L6187	Magstar MP Fast Access Linear Tape Cartridge, C-format	-	-	-	-	-	-	-	-	-	-	-	-

1. Transfer rates are for single SCSI channel configurations. Tape libraries utilizing split library or dual host configurations may obtain higher rates. Data compression typically provides a 2X improvement in capacity and transfer rate, but since data compression is affected by many factors, actual improvements may be more or less than 2X.
2. Includes Fixed Shelf (P/N 94G7442) for installation in an IBM rack or NetBAY22.
3. Upgrade 33L4979 is an additional drive for 3502x14 DLT Tape Libraries. Up to two drive upgrades may be installed for a maximum of three drives per 3502x14.
4. Includes rack mounting hardware and two power cords (120 V and 250 V). Models B22 and C22 include an additional 2 power cords.
5. The two tape drives are daisy-chained on the same SCSI bus with an included 0.5 meter SCSI cable. Dual Host and Split Library configurations require 3570 Adapter Card Kit (P/N 08L6517).
6. Required for Dual Host or Split Library configurations with 3570B2x or 3570C2x containing two drives.
7. Required for either dual host or split library operation. Should be installed by qualified service personnel.
8. Magstar MP Media can be ordered by calling 888-IBM-MEDIA or 888-426-6334 in the US, Canada, or Puerto Rico.
9. B-format tape cartridges can be used in either Magstar MP 3570 Model B or C tape drives.

Appendix C: UPS Runtime Estimate (minutes)

Servers	# Pwr. Cords Std/Max	Watts Load Max./Typ.[1]
Netfinity 1000[2, 3]	1/1	225/160
Netfinity 3000[2]	1/1	225/160
Netfinity 3500 M20[2]	1/1	430/300
Netfinity 4000R[2]	1/1	150/105
xSeries 200[2]	1/1	350/245
xSeries 220[2]	1/1	350/245
xSeries 230 / Netfinity 5100[2]	1/3	375/250
xSeries 240 / Netfinity5600[2]	2/3	450/315
xSeries 330[2]	1/1	220/160
xSeries 340 / Netfinity4500R[2]	1/2	390/270
Netfinity 6000R[2]	1/4	525/395
Netfinity 7100[2]	2/4	475/330
Netfinity 7600[2]	3/4	475/330
Netfinity 8500R[2]	3/3	1450/1015
Other Devices		
Netfinity Fibre Channel RAID Controller Unit (3526)[2]	2/2	160/105
FAStT500 Storage Server (3552)[2]	2/2	200/140
FAStT EXP500 Storage Expansion Unit (3560)[2]	2/2	350/245
FAStT200 Storage Server (35421RU)[2]	2/2	390/275
FAStT200 HA Storage Server (35422RU)[2]	2/2	390/275
Netfinity EXP200 Storage Expansion Unit (3530)[2]	1/2	350/280
EXP300 Storage Expansion Unit (3531)[2]	2/2	360/285
SAN Fibre Channel Switch, 8-port (2109S08)	1/2	200/140
SAN Fibre Channel Switch, 16-port (2109S16)	1/2	200/140
SAN Data Gateway Router (Diff.) (2108R3D)	1/1	90/60
SAN Data Gateway Router (SE) (2108R3S)	1/1	90/60
DLT Tape Autoloader and Library (3502)	1/1	135/100
Magstar MP 3570 Tape Subsystem (C2x)	1/1	200/140
NetMEDIA Storage Expansion Unit EL (3551)	2/2	185/130

1. This table represents general guidelines for selecting the appropriate UPS based on minimum and typical runtime estimates. A 'maximum configuration' load will result in 'minimum' UPS runtime. 'Typical' loads are based on a production system running at approximately 70% of maximum capacity. The 'typical' loads represent a more likely configuration and, therefore, a more likely estimate of runtime. Customer environments are unique and are unlikely to be precisely represented by any of the specific entries in the table.
2. Power-Factor Corrected (PFC) power supply.
3. Netfinity 1000 (all models) are not available in Canada or Latin America. Netfinity 1000 (IDE models only) are available in the United States.

		Tower				Rack Mounted		
	INT'L P/N	**SU-700iNET 94G4073**	**SU-1000iNET 94G4074**	**SU-1400iNET 94G4075**	**SU-2200iNET 94G4076**	**SU-1400RMiB 94G6675**	**SU-3000RMiB 94G6677**	**SU-5000RMiB 37L6862**
	US P/N	**SU-700NET 94G3134**	**SU-1000NET 94G3135**	**SU-1400NET 94G3136**	**Not Available**	**SU-1400RMB 94G6674**	**SU-3000RMB 94G6676**	**SU-5000RMB 37L6861**
UPS Attributes								
Communications Links to Servers		1	1	1	1	1	3	3
Color		black	black	black	white	black	black	black
EIA Height		-	-	-	-	3U	3U	5U
International Models								
50 or 60 Hz, single phase, VAC:		220-240 (208)[2]	220-240 (208)[2]	220-240 (208)[2]	220-240 (208)[2]	220-240 (208)[2]	220-240 (208)[2]	220-240 (xxx)[2, 3]
10 Amp, IEC 320-C13 (Device) receptacles		4	4	4	8	4	8	8
16 Amp, IEC 320-C19 (PDU 94G7450) receptacles		-	-	-	1	-	1	2
Line Cord Receptacle (IEC 320-)		C14	C14	C20	C20	C14	C20	TB[5]
US Models								
50 or 60 Hz, single phase, VAC:		120 (120)[2]	120 (120)[2]	120 (120)[2]	-	120 (120)[2]	120 (120)[2]	200-220 (208)[2]
Receptacles (NEMA 5-15R)		4	6	6	-	6	8	-
10 Amp, IEC 320-C13 (Device) receptacles		-	-	-	-	-	-	8
16 Amp, IEC 320-C19 (PDU 94G7450) receptacles		-	-	-	-	-	-	2[4]
Line Cord Length, NEMA Plug		6 ft., 5-15P	6 ft., 5-15P	6 ft., 5-15P	-	6 ft., L5-15P	6 ft., L5-30P	8 ft., L5-30P

1. Data provided by APC.
2. How-to-Read example for 220-240(208): Input VAC is 220- 240 as is the UPS output when electric service is active. When electric service is interrupted and the UPS is on battery the UPS output is 208 VAC.
3. Battery output may be set to 220, 225, 230, or 240 VAC.
4. Two PDU jumper cables ship with the UPS for attachment from the IEC 320-C19 receptacles to Power Distribution Units (PDU) (P/N 94G7450).
5. SU-5000RMiB (P/N 37L6862) contains a Terminal Block (TB) for direct attachment to an electrical source by qualified personnel.

	Total Configuration Runtime Estimator (Time in minutes)[1]						
	Tower				Rack Mount		
International Part Number	**SU-700iNET 94G4073**	**SU-1000iNET 94G4074**	**SU-1400iNET 94G4075**	**SU-2200iNET 94G4076**	**SU-1400RMiB 94G6675**	**SU-3000RMiB 94G6677**	**SU-5000RMiB 37L6862**
United States Part Number	**SU-700NET 94G3134**	**SU-1000NET 94G3135**	**SU-1400NET 94G3136**	**Not Available**	**SU-1400RMB 94G6674**	**SU-3000RMB 94G6676**	**SU-5000RMB 37L6861**
Total Load (Watts)	**Runtime Minutes**	**Runtime Minutes**	**Runtime Minutes**	**Runtime Minutes**	**Runtime Minutes**	**Runtime Minutes**	**Runtime Minutes**
200	22	38	62	130	45	104	240
250	17	28	43	104	34	84	200
300	12	22	34	85	25	70	166
350	9	18	29	71	22	58	145
400	7	14	23	65	18	52	125
450	5	12	20	52	15	45	110
500	-	11	18	43	13	38	97
550	-	9	16	38	11	35	87
600	-	8	13	34	10	31	76
650	-	7	12	31	9	29	68
700	-	6	11	28	8	26	63
750	-	-	10	25	8	24	59
800	-	-	9	23	7	22	55
850	-	-	8	21	7	20	51
900	-	-	7	19	6	18	47
950	-	-	6	18	5	17	43
1000	-	-	-	17	-	16	39
1100	-	-	-	15	-	14	34
1200	-	-	-	13	-	12	31
1300	-	-	-	11	-	10	28
1400	-	-	-	9	-	9	25
1500	-	-	-	9	-	8	22
1600	-	-	-	8	-	8	20
1700	-	-	-	-	-	7	18
1800	-	-	-	-	-	-	17
1900	-	-	-	-	-	-	14
2000	-	-	-	-	-	-	12
2100	-	-	-	-	-	-	11
2200	-	-	-	-	-		11
2300	-	-	-	-	-	-	10
2400	-	-	-	-	-		10
2500	-	-	-	-	-	-	9
2600	-	-	-	-	-		9
2700	-	-	-	-	-	-	8
2800	-	-	-	-	-	-	8

1. Data provided by APC.

Steps:
1. Identify the devices contained in the configuration.
2. Sum the load (watts) of all devices in the configuration. Use either Maximum Load for minimum runtime, or Typical Load for typical runtime.
3. Find the Total Configuration Load in the table above.
4. Select the most appropriate UPS model to achieve the desired runtime.
NOTE: If the Total Configuration Load is greater than the entries above, split the load across two or more UPS units.

Appendix D: Cables - Storage Units - Controllers

F: Female - External
M: Male - External
I: Internal
68: 16-bit, 68-pin High Density connector
50: 8-bit, 50-pin Centronix Connector
0.8: 16-bit, 68-pin Very High Density Connection Interface (VHDCI) 0.8 mm connector
16: 16-bit, 68-pin connector
8: 8-bit, 50-pin connector

Instructions: Identify Desired Controller Row and Storage Unit Column. The intersection of row and column contains the cable group letter which supports the connection. Go to the cable group under the corresponding storage unit for specific support. Read all Notes for row, column, and any cable group footnotes.

Description	Part Number	Max./ Channel (MB/sec)[1]	LVDS	Connector Type/ Max	Note #	35202RU	35301RU	35311RU	3510020	3503B0X	3551001	Adapter 10L7113
Storage Unit						35202RU	35301RU	35311RU	3510020	3503B0X	3551001	Adapter 10L7113
Max.MB/sec.[1]						40	80	160	-	-	-	-
LVDS						X	X	X	-	-	-	-
Connector Type						F0.8	F0.8	F0.8	F68 or F50	F68	F68	F0.8
RAID Storage Controllers												
Netfinity Fibre Channel RAID Controller Unit	35261RU	80	X	F0.8/6	9	A	A	-	-	-	-	-
ServeRAID-4L Ultra160 SCSI Controller	37L6091	160	X	F0.8/1	13	A	A	A	-	-	-	-
ServeRAID-4M Ultra160 SCSI Controller	37L6080	160	X	F0.8/2	13	A	A	A	-	-	-	-
ServeRAID-4H Ultra160 SCSI Controller	37L6889	160	X	F0.8/4	13	A	A	A	-	-	-	-
Netfinity ServeRAID-3HB Ultra2 SCSI Adapter	37L6086	80	X	F0.8/3	-	A	A	A	-	-	-	-
Netfinity ServeRAID-3L Ultra2 SCSI Adapter II	19K0564	80	X	F0.8/1	-	A	A	A	-	-	-	-
Ultra160 SCSI Controllers												
PCI Wide Ultra160 SCSI Adapter	19K4646	160	X	F0.8/1		-	-	-	-	B	B	A
Netfinity 6000R - Ultra160 SCSI	Onboard	160	X	F0.8/1	-	-	-	-	-	-	B	A
Ultra2 SCSI Controllers												
Netfinity 1000- SCSI Models 52Y and up	Adapter	80	X	F68/1	-	-	-		C	C	-	-
Netfinity 3000 - Models 80U and up	Adapter	80	X	F68/1	-	-	-	-	C	C	-	-
xSeries 240 / Netfinity 5600	Onboard	80	X	F0.8/1	-	-	-	-	B	B	B	A
Netfinity 7100	Onboard	80	X	F0.8/1	-	-	-	-	B	B	B	A
Netfinity 7600	Onboard	80	X	F0.8/1	14	-	-	-	B	B	B	A
Netfinity 8500R	Onboard	80	X	F0.8/1	-	-	-	-	B	B	B	A
Ultra SCSI Controllers												
PCI Fast/Wide Ultra SCSI Adapter	02K3454	40	-	F68/1	-	B[11]	B[11]	-	C	C	C[25]	B
Netfinity 1000[15]- SCSI Models 31Y and down	Adapter	40	-	F68/1	-	-	-	-	C	C	-	-
Netfinity 3000 - Models 71U and down	Adapter	40	-	F68/1	-	-	-	-	C	C	-	-
Netfinity 4000R - Non-RAID models	Adapter	40	-	F68/1	-	-	-	-	-	-	B	-
No Onboard External Port[24]												
Netfinity 1000(IDE)[16]	N/A	-	-	n/a	17	-	-	-	-	-	-	-
Netfinity 3500 M20	Onboard	-	-	n/a		-	-	-	-	-	-	-
Netfinity 4000R - RAID models	Adapter	80	X	F0.8/1	23	-	-	-	-	-	-	
xSeries 200	Onboard			n/a		-	-	-	-	-	-	
xSeries 220	Onboard			n/a		-	-	-	-	-	-	-
xSeries 330	Onboard			n/a		-	-	-	-	-	-	-
xSeries 340 / Netfinity 4500R	Onboard			n/a		-	-	-	-	-	-	-
xSeries 230 / Netfinity 5100	Onboard			n/a		-	-	-	-	-	-	-
Related Options												
0.8mm to 68-pin SCSI Adapter	01K8017	-	-	M0.8-F68	18	-	-	-	-	-	-	-
Cable Group A (M0.8-M0.8)												
Netfinity 2M Ultra2 SCSI Cable	03K9310	-	X	M0.8-M0.8	19	X	X[20]	X[20]	-	-	X	X
Netfinity 4.2M Ultra2 SCSI Cable	03K9311	-	X	M0.8-M0.8	19	X	X	X	-	-	X	X
Netfinity 20 M Ultra2 SCSI Cable	37L7101	-	X	M0.8-M0.8	10	X[10]	X[10]	X	-	-	-	-
Cable Group B (M68-M0.8)												
1M External.8mm SCSI Cable	76H3589	-	-	M68-M0.8	-	X	X	X	X	X	X[25]	X[25]

F: Female - External
M: Male - External
I: Internal
68: 16-bit, 68-pin High Density connector
50: 8-bit, 50-pin Centronix Connector
0.8: 16-bit, 68-pin Very High Density Connection Interface (VHDCI) 0.8 mm connector
16: 16-bit, 68-pin connector
8: 8-bit, 50-pin connector

Instructions: Identify Desired Controller Row and Storage Unit Column. The intersection of row and column contains the cable group letter which supports the connection. Go to the cable group under the corresponding storage unit for specific support. Read all Notes for row, column, and any cable group footnotes.

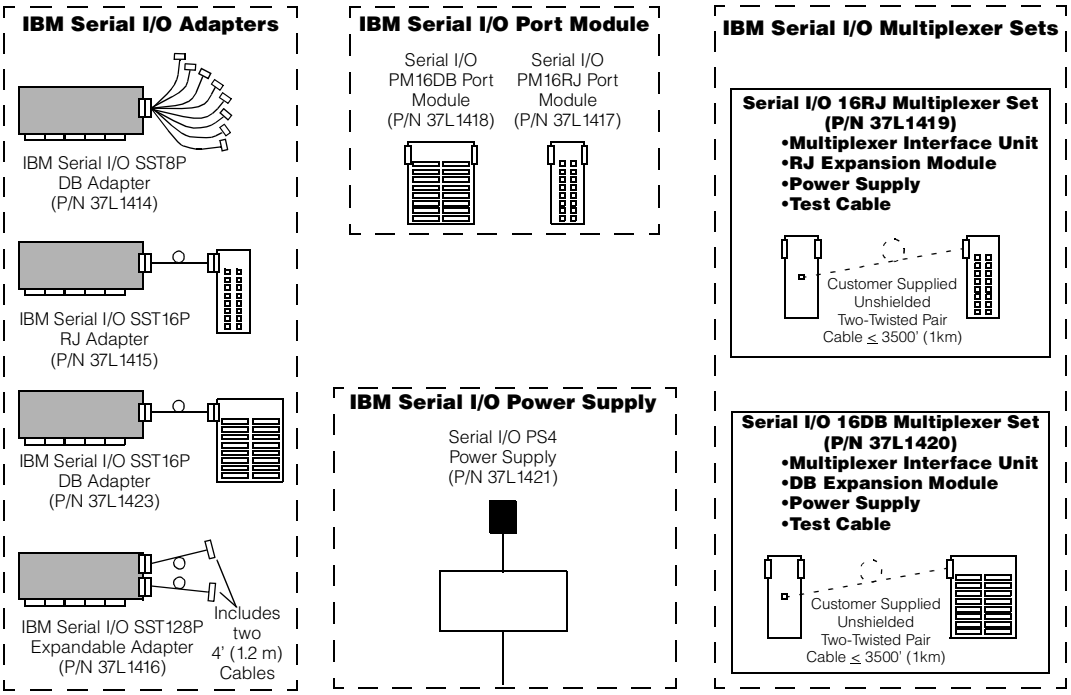
Storage Unit	35202RU	35301RU	35311RU	3510020	3503B0X	3551001	Adapter 10L7113
Max.MB/sec.[1]	40	80	160	-	-	-	-
LVDS	X	X	X	-	-	-	-
Connector Type	F0.8	F0.8	F0.8	F68 or F50	F68	F68	F0.8

Description	Part Number	Max./ Channel (MB/sec)[1]	LVDS	Connector Type/ Max	Note #	2, 3	2, 4	2, 5	6	6, 7	2, 6	2, 6, 8
2M External.8mm SCSI Cable	01K8027	-	-	M68-M0.8	-	X	X	X	X	X	X	X
Cable Group C (M68-M68)												
PC Server F/W to F/W External SCSI Cable-1m	70G9857	-	-	M68-M68	25	-	-	-	X	X	X[25]	-
Cable Group D (Short Wave Fibre)[21]					-							
Netfinity Fibre Channel 1 M Cable	36L9973	-	n/a	S/W Fibre	-	-	-	-	-	-	-	-
Netfinity Fibre Channel 5 M Cable	03K9306	-	n/a	S/W Fibre	-	-	-	-	-	-	-	-
Netfinity Fibre Channel 25 M Cable	03K9305	-	n/a	S/W Fibre	-	-	-	-	-	-	-	-
Customer supplied cables ≤500M (0.31 miles)	**********	-	n/a	S/W Fibre	-	-	-	-	-	-	-	-
Cable Group E (Long Wave Fibre)[21]					-							
Customer supplied cables ≤ 10 KM (6.2 miles)	**********	-	n/a	L/W Fibre	-	-	-	-	-	-	-	-
Cable Group G (Other)												
68-pin External Multimode LVD/SE SCSI Terminator	00N7956	-	-	M68	-	-	-	-	X	X	-	-
GBIC[21]					-							
Netfinity Fibre Channel Short-Wave GBIC	03K9308	-	n/a	S/W Fibre	22	-	-	-	-	-	-	-
Netfinity Fibre Channel Long-Wave GBIC	03K9307	-	n/a	L/W Fibre	-	-	-	-	-	-	-	-

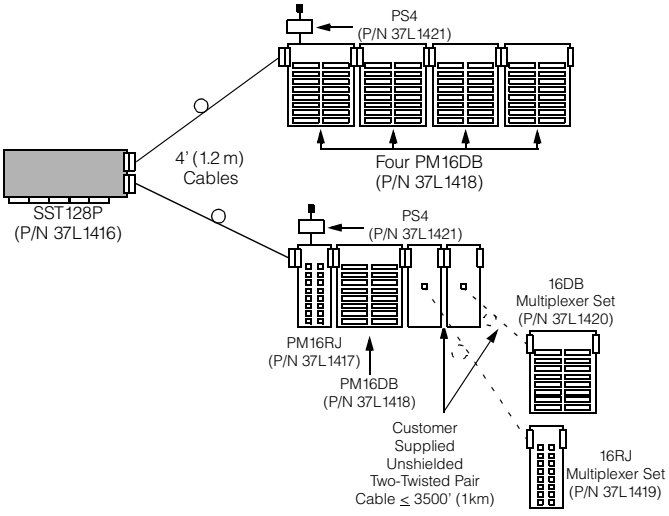
1. Maximum supported speeds may be limited by installation of lower speed devices, controllers or cable lengths greater than 2 meters.
2. Rack installation cable management requires devices to have a minimum cable length of 2 meters. Cable length requirements will vary based on placement within a single or multiple rack suite.
3. Attachment to wide ultra SCSI controllers limits operational speeds to Ultra SCSI (40 MBps) for cables up to 2 meters in length and Fast/Wide SCSI (20 MBps) for cable lengths between 2 meters and 4.3 meters. Ultra2 SCSI controllers and cables allow cable lengths of up to 20 meters at up to 40 MBps.
4. Attachment to wide ultra SCSI controllers limits operational speeds to Ultra SCSI (40 MBps) for cables up to two meters in length and Fast Wide (20 MBps) for cable lengths between 2 meters and 4.3 meters. Ultra2 SCSI controllers and cables allow cable lengths up to 20 meters at up to 80 MBps.
5. Maximum speeds may be limited by the installed devices or SCSI controller.
6. Daisy chaining tape enclosures is not supported at this time.
7. Requires 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
8. NetMEDIA Systems Management Adapter (P/N 10L7113) may be installed in a 3551001 to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the 3551001 is powered off. External connector is 0.8-mm VHDCI.
9. Connection to either IBM SAN Fibre Channel Managed Hub (P/N 35341RU) or Netfinity Fibre Channel PCI Adapter (P/N 01K7297) requires short wave fibre cables from Cable Group D.
10. Cable lengths exceeding 4.3 meters are NOT supported for attachment to non-Ultra2 controllers.
11. Installations with cable lengths greater than 2 meters are limited to SCSI Fast/Wide speeds of 20 MBps.
12. RAID support for tape drives is limited to Non-RAID functions and utilization of a dedicated channel.
13. Maximum speeds may be limited by the enclosure or its installed devices.
14. Netfinity 7600 also includes a Netfinity ServeRAID-3HB Ultra2 SCSI Adapter (P/N 37L6086). See ServeRAID-3HB for connectivity requirements.
15. Netfinity 1000 SCSI models are not available in the Americas.
16. Netfinity 1000 (IDE models) are not available in Canada or Latin America.
17. Does not support external attachment of SCSI devices attached to optional controllers.
18. Converts a F0.8mm into a F68-pin connector for attachment of an external M68 cable.
19. Supports attachment to Ultra2 or single-ended SCSI controllers with operational speeds of up to Ultra2. Controller, storage unit, cable length or storage device limitations may apply (see Max. MB/sec row and column above).
20. Netfinity EXP200 (P/N 35301RU) and EXP300 (P/N 35311RU) include a single 2 meter Ultra2 SCSI cable similar to Netfinity 2 M Ultra2 SCSI Cable (P/N 03K9310).
21. See Fibre Array Solutions for device attachment.
22. Short wave GBICs are included with various devices. See Fibre Array Solutions for device specifics.
23. The RAID adapter has both an internal and external port. Only one of the two ports may be used. The internal HDDs are attached to the RAID adapter therefore the external port must not be used.
24. No external SCSI port is available on these systems. A supported optional controller must be installed. See the systems section to determine which controllers and external storage units are supported then refer back to this table for cable requirements using the controller row. The Netfinity 4000R does not support customer installation of adapters that must be installed inside the server. Non-standard features must be installed at the factory. Contact your IBM Marketing Representative for more information.
25. Not supported for use in a rack. Rack installations require a minimum cable length of two meters.

For the latest product & technical information, refer to the Information Sources on pages 1 and 2.

Appendix E: IBM Serial I/O


IBM Serial I/O Adapters
IBM Serial I/O SST8P DB Adapter (P/N 37L1414)
IBM Serial I/O SST16P RJ Adapter (P/N 37L1415)
IBM Serial I/O SST16P DB Adapter (P/N 37L1423)
IBM Serial I/O SST128P Expandable Adapter (P/N 37L1416)
Includes two 4' (1.2 m) Cables
IBM Serial I/O Port Module
Serial I/O PM16DB Port Module (P/N 37L1418)
Serial I/O PM16RJ Port Module (P/N 37L1417)
IBM Serial I/O Power Supply
Serial I/O PS4 Power Supply (P/N 37L1421)
IBM Serial I/O Multiplexer Sets
Serial I/O 16RJ Multiplexer Set (P/N 37L1419)
•Multiplexer Interface Unit
•RJ Expansion Module
•Power Supply
•Test Cable
Customer Supplied Unshielded Two-Twisted Pair Cable ≤ 3500' (1km)
Serial I/O 16DB Multiplexer Set (P/N 37L1420)
•Multiplexer Interface Unit
•DB Expansion Module
•Power Supply
•Test Cable
Customer Supplied Unshielded Two-Twisted Pair Cable ≤ 3500' (1km)

Sample Configurations


PS4 (P/N 37L1421)
4' (1.2 m) Cables
Four PM16DB (P/N 37L1418)
SST128P (P/N 37L1416)
PS4 (P/N 37L1421)
16DB Multiplexer Set (P/N 37L1420)
PM16RJ (P/N 37L1417)
PM16DB (P/N 37L1418)
Customer Supplied Unshielded Two-Twisted Pair Cable ≤ 3500' (1km)
16RJ Multiplexer Set (P/N 37L1419)

37L1414	Serial I/O SST8P DB Adapter[1, 6]
37L1415	Serial I/O SST16P RJ Adapter[2, 6]
37L1423	Serial I/O SST16P DB Adapter[3, 6]
37L1416	Serial I/O SST128P Expandable Adapter[4, 6]
37L1417	Serial I/O PM16RJ Port Module[5]
37L1418	Serial I/O PM16DB Port Module[5]
37L1419	Serial I/O 16RJ Multiplexer Set[5, 7]
37L1420	Serial I/O 16DB Multiplexer Set[5, 7]
37L1421	Serial I/O PS4 Power Supply[5]

(1) Intelligent serial I/O interface card providing eight DB-25 RS232 serial connections using an octopus cable. Support for all ports at 921.6 Kbps simultaneously.
(2) Intelligent serial I/O interface card providing sixteen RJ-45 RS232 serial connections in a breakout box. Support for all ports at 115.2 Kbps simultaneously.
(3) Intelligent serial I/O interface card providing sixteen DB-25 RS232 serial connections in a breakout box. Support for all ports at 115.2 Kbps simultaneously.
(4) Intelligent interface card providing up to 128 RS232 serial connections (DB25 or RJ45) configured in 16 port increments utilizing any combination of Port Modules and Multiplexer Sets. Includes two 4' (1.2 m) bus cables. Each 4' cable supports attachment of 1 to 4 Port Modules and/or Multiplexer Interface Units for a total of 8 per adapter. The first Port Module or Multiplexer Set attached to a cable requires a Serial I/O PS4 Power Supply (P/N 37L1421). Support for all ports at 115.2 Kbps simultaneously.
(5) Port Modules and Multiplexer Sets attach directly to one the two standard 4' (1.2m) bus cables of the Serial I/O SST128P Expandable Adapter (P/N 37L1416) or directly to 1 or more Port Modules or Multiplexer Sets already attached to one of the cables. A maximum of 4 Port Modules or Multiplexer Sets may be attached to a single cable. The first Port Module or Multiplexer Set attached to a cable requires a Serial I/O PS4 Power Supply (P/N 37L1421).
(6) Serial I/O Adapters are 32-bit PCI half length cards. A maximum of four Serial I/O adapters (in any combination) may be installed in a single host system.
(7) Requires a customer supplied Unshielded Two-Twisted Pair (Category 3 minimum) cable with a maximum length of 3,500 feet (1 Km).

Important Notes

IBM reserves the right to change product specifications and to discontinue marketing products without notice.
*MHz only measures microprocessor internal clock speed, not application performance. Many factors affect application performance.
**When referring to hard drive capacity, GB stands for one billion bytes.Total user-accessible capacity may vary depending on operating environments.
***The quotation function within OrderBUILDER allows reseller specific pricing to be included.
****Tape Drives which utilize data compression technology have storage capacity that will vary depending upon whether the drive is operating in native mode (without compression) or compressed mode. Actual storage capacity will vary based upon many factors and may be less than the maximum possible.
Maximum internal hard disk drive capacities assume the replacement of any hard disk drives and the population of all hard disk drive bays with the largest currently supported drives available from IBM.
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